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Identification of productive thought processes in intellectually gifted children were sought within the context of classroom verbal activity at the junior high school level. Relationships between these thought processes and certain variables that may affect their operation in the classroom were assessed. Areas explored were: cognitive structure and process, cognitive style, the development of measuring instruments, the implications of sex differences, and the teaching environment of the classroom.

A separate, self-contained unit by William C. Jenne entitled "The Families of Gifted Children" is appended. Its basic purpose was to attempt to gain insights into the relationship between family environment and the gifted child's performance both in the classroom and on paper and pencil tests of divergent ability. The procedure for gathering data, instruments and classifications used in the analyses, and results of the factor analyses are discussed. A special analysis of the relationship between parental emphasis on the child's achievement and independence and the child's classroom performance is included.

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OF GIFTED CHILDREN

Cooperative Research
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James J. Gallagher

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INSTITUTE FOR RESEARCH ON
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1965

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PRODUCTIVE THINKING OF GIFTED CHILDREN

Cooperative Research Project No. 965

James J. Gallagher

Institute for Research on Exceptional Children
University of Illinois
Urbana, Illinois

1965

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JJG

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BACKGROUND OF PROJECT

Research in the Classroom

It is no doubt an historical impossibility to establish the first time someone said "It's what the teacher does that counts." While it would be difficult to find anyone who would disagree substantially with such a statement, it is manifestly true that, before the last two decades, educational research had not devoted much time to the study of teacher behavior or to teacher-pupil interaction.

A generation of research personnel in the educational field have matured with the belief that the ideal research project is an evaluation design carefully patterned after a biological-medical type of research paradigm. In the most careful of these kinds of educational research projects, the students are randomly distributed into control and experimental groups. The experimental group gets the treatment (often a new program of instruction) and the control group receives nothing, or the equivalent of a placebo. During the period of the experiment, frequent measurements and re-examinations are taken in order to chart the course and effectiveness of the treatment.

The teacher-pupil interactions that were the essence of the 'treatment' that was measured was considered equivalent to a 5 mg. pill in a medical experiment. In the analysis of results a further assumption was often made that one 'pill' was pretty much the same as another. In other words, the assumption was made, with whatever personal misgivings of the investigator, that one teacher instructing in phonics, or the new biology, or whatever the educational 'treatment', was pretty much the same as another.

The crucial difference between medical and educational research is that the biochemist knows in great detail what is in his pill but the educator has little or no idea what is in his 'treatment' pill, namely the teacher-pupil interaction. As a result, the amount of useful information coming from these evaluation studies, either for theoretical or practical applications have been limited, to say the least. The meager returns obtained from such extended and expensive projects have led Smith & Meux to comment:

> "The failure of such studies to yield a body of consistent knowledge about instruction indicates that perhaps they are premature; that more direct and primitive analyses of teaching behavior are needed as a preface to experimental and correlational studies." (1962, p.2)

The author is in complete agreement with this statement. However, research often follows the development of technology. Just as the invention of the microscope opened up a new world previously unavailable to research scientists, thus the invention and development of techniques of recording (both auditory and visual) have opened up a new world to the educational research person.

The forerunners of this current research project were represented by attempts to use observational techniques to understand the classroom environment (Medley & Mitzel, 1963) and also to study the sociology of small groups (Heyns & Lippit, 1954). Most of these research projects have investigated variables that relate to the emotional climate and control influences of the teacher on the students, an approach that was pioneered by the work of Anderson (1939) in his study of dominative and socially integrative behavior in the classroom.

Some of the later and more sophisticated efforts in this direction are represented in the work of Flanders (1960, 1963) where an involved observational technique of interaction analysis has been used to not only understand the ebb and flow of classroom processes, but also as a method of training teachers to be aware of the influence they have in expanding or contracting the experience potential of the students in their classrooms.

These observational studies have made an important contribution in terms of identifying fruitful variables for future investigation, and in providing some of the initial work dealing with such measurement problems as judges' reliability and the development of a variety of statistical techniques to handle the data. Despite this, however, there are some built-in limitations to observational techniques that need to be seriously considered. Medley & Mitzel (1963) have suggested that the validity of the measurement of behavior depends on the fulfillment of three conditions:

> "1. A representational sample of the behaviors to be measured must be observed.
>
> 2. An accurate record of the observed behaviors must be obtained.
>
> 3. The records must be scored so as to faithfully reflect differences in behavior." (1963 p. 250)

While there are serious questions related to point 1 in most observational studies, it is point 2 that concerns this author. No matter how elaborate the observation or how many judges are involved, the essential limitation of the observation system is that there is only one type of behavior that can be observed at a particular moment. Once that moment has passed, only that one piece of behavior of the total remains as evidence of what reality was.

The inability to recreate the essential raw data of the situation once it has passed presents an insuperable barrier to the sophisticated analysis of interaction and sequential development of concepts or the multiple interrelationships of variables operating in the classroom at the same time. These problems can be overcome by the use of visual and auditory recordings which are attempts to preserve the experience so as to more fully analyze its complexities. The advantages of this approach used in the current study are shown in the increasing sophistication of the work of Smith & Meux (1962), Spaulding (1963), Taba, et.al. (1964) and Hughes (1959) among others.

A number of other investigators have tried to develop systems of classification of cognitive behavior for a variety of purposes. One impressive effort is the taxonomy of education objectives described by Bloom, et.al. (1956). This taxonomy was designed to enable test constructors and curriculum builders to have some common language of communication and to provide a structure through which one could examine and evaluate educational programs. The taxonomy possesses many similarities to the present category system in those categories directly related to the cognitive domain.

Another complex theoretical model using the concepts of teacher-student interaction, and encompassing affective as well as cognitive domains, has been proposed by Ryans (1960, 1963). This model has incorporated some of the computor language using such terms as information processing and feedback as key concepts.

Gage (1963) has provided a useful summary of a variety of paradigms or models that are in current usage in the study of the teaching process. Which of these models has the most utility will be decided by the amount of research each generates and the number of fruitful hypotheses that can be derived from them.

Research in Cognitive Processes

In comparison to the enthusiastic development of the areas of attitude and personality, which received great attention in psychological circles following World War II, interest in cognitive development and processes had languished. Complex thought processes were either ignored or dismissed as being measured adequately by intelligence test scores. The idea that 'Intelligence is what an intelligence test measures' was followed in such practical matters as the definition of mentally retarded and intellectually gifted children. The few highly specialized laboratory studies on complex thought processes were not of much help in expanding our concepts.

Gallagher (1964) noted four major differences between the laboratory tasks and the more normal learning environment of the individual. (See Table 1.) In a real life situation, a problem must be selected by the individual from among many, whereas in the laboratory, the problem has already been selected for the subject. Extraneous pressures and distractions impinge upon the person trying to solve complex problems in reality but in the laboratory, extraneous stimuli are reduced or systematically introduced. The difficult problems demanding complex thoughts often extend for weeks and months, whereas the laboratory problem must be chosen in such a way so that it can be solved in a short period of time.

TABLE 1

Differences Between Laboratory Exercises and Reality in Use of Productive Thinking[1]

LABORATORY	REALITY
Problem selected for subject.	Problem must be chosen from many other stimuli competing for attention of the subject.
Extraneous stimuli reduced or systematically introduced.	Extraneous pressures and distractions randomly presented.
Problem chosen so it can be solved in a short period of time.	Difficult problems often extend for weeks and months before solution.
Emotional involvement limited.	Emotional involvement often severe, affecting self-status, livelihood, family, professional career, etc.

---

[1] From Gallagher, J. J., Productive Thinking in Review of Child Development Research, Volume I, New York: Russell Sage Foundation, 1964, p. 353.

Finally, and perhaps more important, the experimental task often is an inadequate sample of the construct being investigated. Is a conditioned eye blink really isomorphic to the construct of anxiety? Is the inability to solve the water jar problem isomorphic to rigidity? Is the ability to find many uses for a brick really isomorphic to creativity? It is in this area that the results of the laboratory studies should receive strictest scrutiny.

The results of the inability of the laboratory task to come to grips with more important constructs have been reflected in the comments of reviewers. Corman (1958) commented that "Problem solving meant the behaviors that researchers, who say that they are studying problem solving, study." Duncan (1959) made the following summary statement:

> "The field of problem solving is poorly integrated. the reasons for this seem to be the use of a great variety of tasks to provide problems, the frequent use of unanalyzed and nondimensionalized variables, the lack of agreed upon taxonomy and, to some extent, the failure to relate data to other data or theory." (p. 426)

Two trends have been established that bring hope for a more meaningful and systematic approach to complex thought processes. One is represented by the work of Piaget, the Swiss psychologist whose intensive case history studies of children's thinking abilities in various developmental stages have finally made a definite impact on American education and psychology. The second trend is represented by the work of Guilford who developed a comprehensive picture of the intellectual processes and operations. While these approaches differ quite strikingly from one another, they both have the happy faculty of providing a rather comprehensive model of the cognitive processes and allow for the development of testable hypotheses which eventually can build a picture of complex thought development and operation.

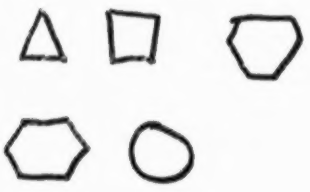
At this writing, it appears that Piaget's major contribution is in focusing attention on some very discrete kinds of thought operations occuring at various stages in the child's development. It appears that maturing intelligence, far from being the smooth and even developmental curve as pictured by the test constructors is, in fact, a curve of uneven growth where certain mental operations may be present at certain ages but not available at others. Thus, attention has been focused on such concepts as conservation and transitivity which appear absent in children less than six years old but present in varying degrees after that age.

Guilford's early interest in creativity (1950) seemed to play a large role in the development of his now familiar structure of intellect. He divides the intellect into three major dimensions, content, operations, and products. The subcategories of these three dimensions are:

Content	Operations	Products
Figural	Cognition	Units
Symbolic	Memory	Relations
Semantic	Divergent Thinking	Classes
Behavioral	Convergent Thinking	Implications
	Evaluation	Transformations
		Systems

Guilford's factor analytic research has concentrated on the discovery of tasks that could measure all possible combinations of the above content, operations and products. For example, the tasks listed below contain the same operations (cognition) and the same products (classes) but vary on the dimension of content.

WHICH ONE DOES NOT BELONG?[1]



Figural

Chair Sofa

Table Bed

Refrigerator

Semantic

25 49

81 14

64

Symbolic

This model, which has undergone progressive revision with new evidence (Guilford, 1956, 1959), has the attractive feature of including many thought processes and operations that did not seem to be covered by the usual intelligence test. For instance, few intelligence tests have items that could call for divergent thinking, originality, flexibility, etc. Even so, it seems likely that such a model would have more theoretical interest than practical application except for the fact that some of Guilford's tests have been used in educational experiments that obtained what seemed to be important results.

Getzels & Jackson (1962) distinguished between two different types of individuals they called 'high creative' and 'high IQ' adolescents. The high creative students seem to be those who performed well on divergent thinking tasks but were not within the top 20% on IQ scores; whereas, the high IQ score group was identified in a reverse manner. With these two groups, these investigators found differences in teacher rating, personality and self-concept, and cognitive style. They state, "One focuses on what is already discovered, the other focuses on what has yet to be known." (1962, p. 14.) While this study has collected an impressive sample of virulently critical reviews because of a number of methodological errors, (see, for example, Thorndike, 1963) it still contains many rich ideas and concepts.

---

[1] from Gallagher, J. J. TEACHING THE GIFTED CHILD, Allyn & Bacon, 1964, p. 178.

Torrance (1959) essentially replicated the experimental results of Getzels & Jackson in an elementary school setting, thus underlining differences between the cognitive styles of these two groups of youngsters, 'high creative' and 'high IQ'. It thus appeared that the Guilford structure of intellect was not only of theoretical interest in understanding cognitive behavior, but also represented some considerable potential for educational application. It was on this assumption that the present project used the Guilford model in building a classification system of classroom interaction. A number of other investigators such as Witkin, et.al. (1962), Schachtel (1959) and Maslow (1959) have seen basically the same difference in cognitive style although their labels for these behaviors were different. The confusing results obtained on the relationship of this type of cognitive style to the construct of anxiety is good evidence as to the incompleteness of the findings in this area. Flescher (1963) followed the Getzels & Jackson method of identifying high creative-low intelligence vs. low creative-high intelligence children. He administered a large variety of intelligence and achievement measures along with tests of divergent thinking and measures of anxiety to a sixth grade population of a New York school district. Flescher obtained four groups from the total sample:

1. High IQ-High Creative
2. Intellectually Talented
3. Creatively Talented
4. Non-Talented

The measures of anxiety obtained in this sample did not relate to either divergent thinking or to the other variables. Flescher, like other investigators, has begun to question the assumption of an isomorphic relationship between divergent thinking and actual creative production. He suggested that the "dubious validity of measures of creative productivity suggest the need for establishing rigorous scientific criteria to preclude the spurious identification of creative individuals." (1963, p. 267)

The negative findings of Flescher however, were contradicted by Denny & Feldhusen (1962) who suggested that high anxious females do better on divergent tests. There were no differences between low anxiety females and the males in these samples. Another study by Wadia & Newell (1963) suggested that anxiety is related positively to convergent thinking when the measures were given to a sample of 40 sixth grade students in a New England elementary school. Clearly, these different results call for more careful analysis since differing measuring instruments and small samples have confounded the clear conceptualization of relationships. As Guilford's theoretical model matures and is modified by experience many similar paradoxes or confusing results may be expected to occur.

STATEMENT OF THE PROBLEM

This project seeks: (1) to identify productive thought processes in intellectually gifted children within the context of classroom verbal activity at the junior high school level, and (2) to assess relationships between these thought processes and certain variables that may relate to their operation in the classroom.

Special Project Objectives

The objectives were as follows:

1. Apply a classification system to the classroom verbal interaction of intellectually gifted children in order to tabulate productive thought occurances and to examine the following propositions:

a. That children will differ significantly from one another in their patterns of classroom verbal behavior in terms of divergent, convergent and evaluative thought processes.

b. Variations in the teacher's verbal activities will relate significantly to variations in patterns of thought processes evidenced in his students. (e.g., the teacher's request for divergent thought processes will typically precede imputed instances of divergent thought processes in students.)

c. Verbal behavior in classes of gifted children will show certain identifiable patterns and sequences, regardless of course content or type of school (public junior high school vs. special school for the gifted).

2. Relate manifestations of productive thinking in classroom verbal interaction of gifted children to other evidence of productive thinking in order to look at the following proposition:

   a. Individual children evidencing a high proportion of imputed productive thought processes in classroom verbal performance will achieve high scores on tests of productive thinking.

3. Correlate differences measured in classroom verbal activities of gifted children with differences measured in attitudes, self-concept, and other variables presumably related to intellectual productivity, in order to test the following hypotheses:

   a. A low level of productive thinking in classroom verbal activities will be associated with negative attitudes toward work, school and society.

   b. Frequency and quality of verbalization in class discussion will relate significantly to self and self-ideal concepts. (e.g., Girls may talk less than boys because of differences in perceived role behavior.)

The present project represents the descriptive and correlational phase within a long-term program of research that is aimed at: (1) the experimental determination of teaching methods that foster productive thinking in the classroom, and (2) the identification of factors that influence productive thinking in the educational programs of our schools.

METHOD

Subjects

The subjects in the present study were all academically talented students at the junior and senior high school level enrolled in a university laboratory school or in a public junior high school. These students were chosen for the present study from others in the same academic setting because they happened to be attending class sessions that were recorded to cover the subject matter areas of Social Studies, Science and English.

In the University laboratory school setting, the groups of BAKER-CHARLIE and HAT-IDEA represented almost the entire sub-freshman class (combined 7th-8th grade) of students accepted into University High School at the University of Illinois. Students must apply for entrance to this school and were chosen for entrance into the school on the basis of performance on the Lorge-Thorndike Group Intelligence Test, Cooperative Achievement Tests, past academic record and teacher recommendations. The DAN-EASY groups represented two sections of a science class at the freshman level in the same school, with the recordings taken one year later.

The public school students recorded in the present study were in groups FOX-GEORGE and JACK-KING. These students were placed in accelerated classes in Science and English because of high performance on IQ and achievement tests and past evidence of academic efficiency. Table 2 indicates the means and standard deviations of intelligence test scores and chronological age for the groups divided by sex and by teacher. Each teacher had two sections of students to instruct in substantially the same subject matter.

The groups range in CA from twelve to fifteen years. The high standard deviation in CA found in DAN-EASY group is due to the fact that some of the members of the group had previously been accelerated, while others were attending the high school freshman level at the usual age.

The verbal and non-verbal IQ scores indicate a rather close similarity of the groups to one another on these variables. These results indicate that the classes in this study can be considered similar to one another and that they are, in fact, groups of gifted students. The mean verbal IQ is quite consistent among groups and places the groups at about the top 2% of the general population. Since these are group IQ tests the chances are good that these scores are an underestimation of what students would be able to do on individual intelligence tests. In cases where both group and individual IQ test results were available, the group IQ tests were almost always below that obtained on the individual measure due to the lower ceiling on group intelligence tests for youngsters of high-level ability.

There do not seem to be meaningful differences between the boys and the girls in ability as measured by these tests with the inexplicable exception of the non-verbal IQ scores in the HAT-IDEA group in which the boys appeared to be somewhat superior. With this single exception, these groups would seem to be matched reasonably well on sex as well as across groups in terms of the measured rate of mental growth in both the verbal and non-verbal areas.

TABLE 2

Sample Characteristics on CA (in Months) and IQ

		CA		Verbal IQ		Non-Verbal IQ	
BOYS	N	Mean	σ	Mean	σ	Mean	σ
BAKER-CHARLIE	23	145.87	4.35	130.96	9.12	128.09	10.69
DAN-EASY	15	166.53	8.20	130.13	7.19	128.80	10.79
FOX-GEORGE	29	159.86	3.61	131.17	6.87	134.59	10.28
HAT-IDEA	25	148.32	3.90	133.12	11.10	131.32	7.82
JACK-KING	26	175.54	3.54	129.73	9.93	132.54	9.85
GIRLS							
BAKER-CHARLIE	20	145.35	4.72	134.35	10.77	128.00	12.63
DAN-EASY	20	167.05	9.17	132.20	10.83	125.30	14.84
FOX-GEORGE	32	159.59	3.98	128.97	8.31	131.72	10.49
HAT-IDEA	17	149.47	4.08	127.24	9.07	122.88	8.45
JACK-KING	28	175.11	4.29	127.21	9.76	130.54	11.40

In addition to the samples directly involved in the tape recordings, two reference groups were used in the analysis of the test results, to lend stability to the factor analytic data and subsequent multiple regression analysis. Reference Group A consisted of all students applying to University High School in 1959, 1960, and 1961. All of these students would have been completing their sixth grade at the time that the tests were administered.

The selection of students for entrance to University High School (Uni High) was done on a random basis from a pool of students who had satisfied the entrance requirements. These requirements included a verbal IQ score on the Lorge-Thorndike test of about 125 or above, a score on the Cooperative Reading tests of 8-9th grade proficiency and about seventh grade proficiency in arithmetic. Children with serious motivational and personality problems, as revealed in interviews and teacher recommendations, were not accepted into this pool.

Since the actual selection of students was drawn in a random basis from that pool, it was felt that they could be used as a reference group in the present study. This increased the N and consequently the stability of the factors obtained in the later factor analysis and multiple regression analysis.

TABLE 3

IQ Scores for Reference Groups in Study

	N	Verbal IQ		Non Verbal IQ	
		Mean	σ	Mean	σ
Reference Group A	242	130.63	8.45	126.88	10.95
Reference Group B	106	129.50	9.25	130.16	11.72

Reference group B consisted of all the students included in DAN-EASY, FOX-GEORGE and JACK-KING groups, in addition to students in these classrooms who could not be included in the classroom data for a number of miscellaneous causes, mainly for absences during the week of the recording.

Two reference groups were used because of the different ages of the classroom groups and different measuring instruments used in the study. Table 3 gives the mean verbal and nonverbal IQ scores on the two reference groups. It can be seen, by inspection, that these scores closely parallel those obtained on the individual classroom groups.

Collection of Classroom Data

The collection of data to provide a faithful reproduction of classroom interaction presented a number of technical difficulties. In this project, the goal was to take five consecutive tape recordings of classroom sessions in twelve classes of intellectually superior children of junior high school age covering the following subject matters: Social Studies, Science and English. It was decided to record five consecutive sessions in order to obtain a reasonable sample of classroom performance. Prior observation of classrooms had indicated that using only one classroom session might run the risk of not representing the typical performance of either student or teacher. Many topics extend over more than one class session and it was felt that we would be able to observe a number of self-contained assignments or discussion topics only by recording an entire school week.

Table 4 indicates the classes that were tape recorded for analysis in the present study. There were a total of ten classes and five teachers. While this small number of teachers and classrooms should make any generalization to other classrooms extremely tentative, we hoped to generate some interesting hypotheses. For instance, the classes called

TABLE 4

Classes Tape Recorded (5 Consecutive Sessions) for

Analysis of Productive Thinking

Class Designation	Subject Matter	Level
BAKER-CHARLIE	Social Studies (Fall) - Social Studies (Spring)	University High Subfreshmen (7 & 8 grades combined)
DAN-EASY	Science	University High Freshman
FOX-GEORGE	Science	Urbana Junior High School 9th Grade
HAT-IDEA	Social Studies	University High Subfreshmen (7 & 8 grades combined)
JACK-KING	English	Urbana Junior High School 10th Grade

BAKER and CHARLIE were tape recorded for five consecutive sessions in the fall and again for five consecutive sessions in the spring of the same school year to enable us to look at the performance of the same classes of students in the same subject matter with the same teacher but with an intervening difference of some five months.

Another goal of the study was to look at the same students in different subject matter. Many of the same students who were in classes BAKER and CHARLIE can also be found in classes DAN and EASY with a switch in content and teacher from Social Studies to Science. In addition, many of the students who were recorded while in their Science classes at the 9th grade level in classes FOX and GEORGE were recorded one year later as members of the classes JACK and KING while taking English. In this way we hoped to see some similarities and differences in student patterns when confronted with different subject matter.

In addition, groups HAT and IDEA covered the same subject matter as BAKER and CHARLIE at the same school at the same level but with another teacher and so there was another possibility of comparison. In this way, we hope to provide some useful hypotheses for further study on some of these questions.

The groups were arranged in pairs (BAKER-CHARLIE) because they represented different sections taught by the same teachers. In practically all instances, the teacher was covering almost identical subject matter in each section and so it was possible to look at his performance twice over the same subject matter with a different group of youngsters.

The seating arrangement was kept the same as in the regular class meetings. The sound was picked up from three standing microphones and was then directed through a mixer and finally into the tape recorder.

Under ordinary circumstances, three members of the project staff were in the classroom during the recording. One of these persons operated the tape recorder and mixer in order to obtain a more effective recording.

Two of the other project members were generally placed in far corners in the classroom behind the students but in a position where they could take notes on who was speaking and also to collect non-verbal material of importance to the project. These observers tried to keep a running account of the sequence of speakers as an aid in identification of students on the tape recording. In addition, they reproduced "board" material or drew diagrams of experimental demonstrations, etc. They also tried to report affect or emotional tone such as sarcasm, wit, intended humor, etc. Two observers were used so that there would be a double check on the accuracy of the student identification and also to enable us to pick up student by-play, or unusual happenings in one corner of the room that one observer might see but the other could not.

The process of transforming the original tape recording into a tape script that could be usable for analysis was one of the most time-consuming tasks in this project. The following sequence represents the tasks involved in this transformation:

A. The tape recording and observer notes were given to a secretary to transcribe. The secretary would then type a rough copy of the classroom procedure as faithfully as possible.

B. Tape recording was then given to the first auditor who was (when possible) one of the observers who was in the classroom at the time of the recording. This auditor would them modify and change the rough draft while listening to the original tape. This often represented a considerable modification from what the secretary (who had not been in the classroom) believed had been said by listening to the tape recording.

C. The modified draft of the class session was then given to a second auditor. Again, when possible, it was the second observer who listened to the tape while following the modified script with the observer notes in order to improve the accuracy of the script.

D. This script (then modified twice) was given to an editor who placed the script in its proper format for typing.

E. This script was then given back to the secretary who typed it on a ditto master and ran off copies of the script. The script was then ready for analysis.

It is the considered judgment of the staff on this project that until there is definite progress made in electronics, alternatives to tape recording need to be seriously considered in doing research of the type involved in the present project. Even under the best of sound conditions young children do not make the best recording subjects. They are restless, move around, do not talk clearly and often are hard to understand. One alternative considered by the project staff has been the possibility of employing a stenotypist similar to a court reporter who could then sit in the class and provide a more useful record of transactions than the tape recorder. It has been found that the tape recording that has been obtained from the class sessions in the present study were not of sufficiently good quality to use for teaching purposes and cost untold hours of listening time of staff and secretarial help to obtain the finished tapescripts.

The Aschner-Gallagher Classification System

It is no disservice to those who have studied the classroom environment such as Aschner (1960), Flanders (1960), Smith (1960), Spaulding (1963) and Taba, Levine and Elzey (1964) to suggest that we are still in the beginning stages of understanding the process of classroom interaction. Indeed, as Smith says:

> "Our knowledge of the act of teaching as well as that of taking instruction is meager. Neither of these acts has been investigated sufficiently to justify from a scientific standpoint, fundamental changes in teaching...the act of teaching has received far less attention than its central role in pedagogy would seem to require."

One of the major prerequisites to an effective analysis of teacher-pupil interaction is some theoretical structure or model by which one can organize the complex data available.[1] At the time the present research project was begun, there was much interest in the potential theoretical contribution of Guilford (1956) and his structure of intellect to this area. The theoretical aspects of the project were highly influenced by his contributions and this influence reveals itself not only in the classification system but also in the choice of measuring instruments used in the present study.

Guilford's model of intellectual performance was developed through a series of sequential studies employing factor analytic methodology. From these he derived his well-known model seen in Figure 1. Of the three major dimensions of the model, products, operations and content,

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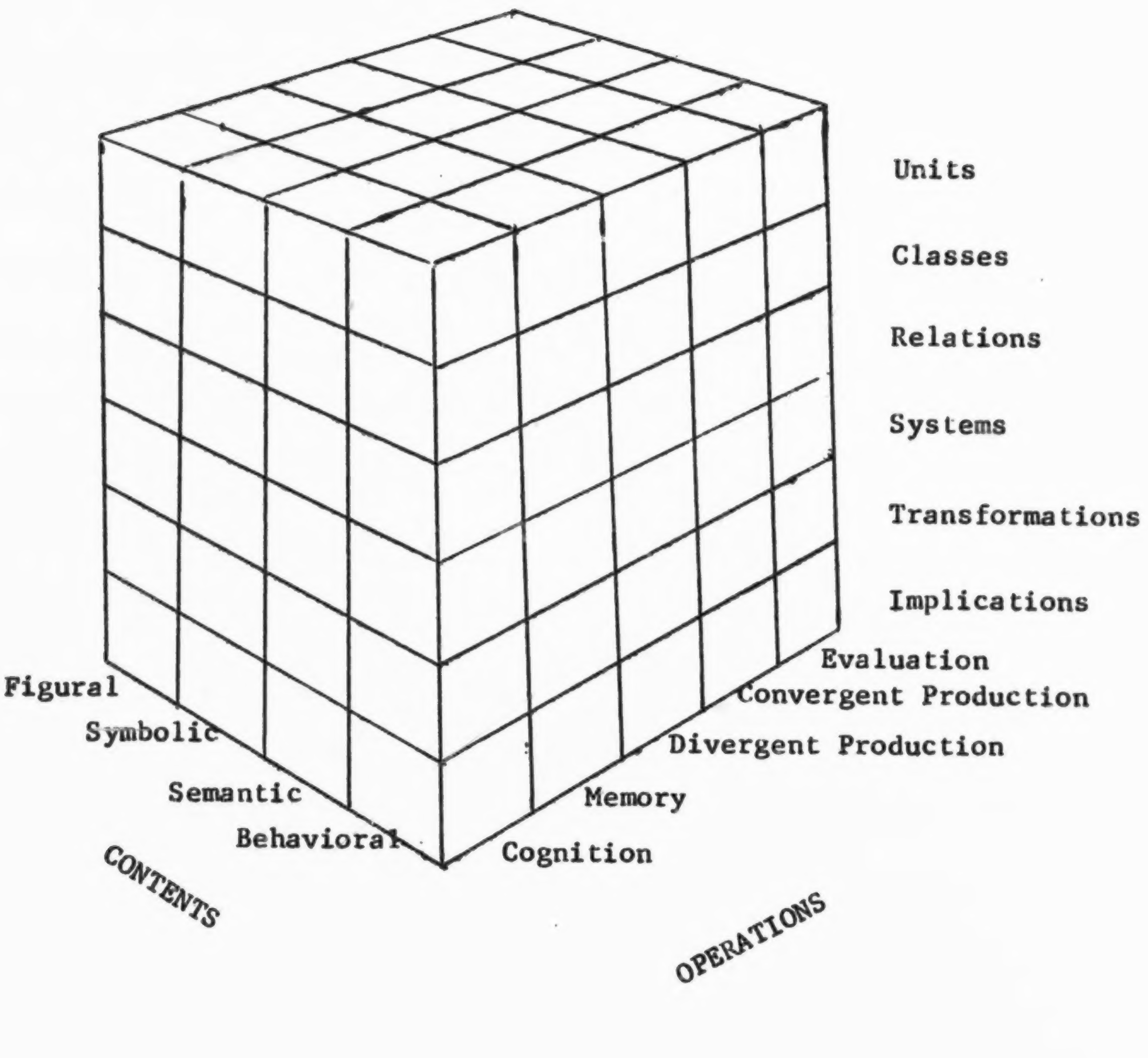
[1] A good list of models currently available is given by Gage (1963).

FIGURE 1

Theoretical Model for the Complete "Structure of Intellect"*


Units
Classes
Relations
Systems
Transformations
Implications
PRODUCTS
Figural
Symbolic
Semantic
Behavioral
CONTENTS
Evaluation
Convergent Production
Divergent Production
Memory
Cognition
OPERATIONS

*Guilford, 1959

we are most concerned, in this study, with operations. Thus, the primary classification categories in the present study were Cognitive-Memory, (C-M); Convergent Thinking, (CT); Divergent Thinking, (DT); Evluative Thinking, (ET); and Routine (R).

In order that the reader have some idea of the dimensions of each of these areas of cognitive behavior in the classroom, a brief description is given below:

Cognitive-Memory[1] operations represents the simple reproduction of facts, formulae, or other items of remembered content through use of such processes as recognition, rote memory and selective recall. Some examples of cognitive-memory performance would be seen in the following:

T: What planet is closest to the sun?

Bill: Mercury, and it doesn't rotate either.

T: What were some of the main points covered in our discussion about mercantilism?

Mary: One of the things we learned was that there was an attempt to keep a favorable balance of trade.

T: Does anybody remember who was the sixteenth President of the United States?

Bob: Abraham Lincoln.

All of the above are examples of teacher-student interchanges that do not require the student to integrate or associate facts; the questions dealt with are of the kind that can be handled by direct reference to the memory bank. The sole duty of the student is to select the appropriate response from his store of remembered items. While factual information is clearly indispensable to the development of higher thought processes, it is also obvious that it would be a sterile and uninteresting class that dealt exclusively with this type of question, never moving into the challenge and excitement of more complex operations.

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[1] Although Guilford separates cognition and memory in his model, it is combined here because of the difficulty in distinguishing these in class interaction and because both represent, from our point of view, non-productive thinking operations.

Convergent thinking represents the analysis and integration of given or remembered data. It leads to one expected end-result or answer because of the tightly structured framework through which the individual must respond. Some examples of convergent thinking follow.

T: If I had 29¢ and gave John 7¢, how much money would I have left?

Bob: Twenty-two cents.

T: Can you sum up in one sentence what you think was the main idea in Paton's novel, Cry The Beloved Country?

Pete: That the problem of the blacks and the whites in Africa can only be solved by brotherly love; there is no other way.

Thus, convergent thinking may be involved in the solving of a problem, in the summarizing of a body of material, or in the establishment of a logical sequence of ideas or premises--as, for example, in reporting the way in which a machine works, or in describing the sequence of steps by which the passage of a bill through Congress is accomplished.

Divergent thinking represents intellectual operations wherein the individual is free to generate independently his own ideas within a data-poor situation, or to take a new direction or perspective on a given topic. Some examples of divergent thinking are:

T: Suppose Spain had not been defeated when the Armada was destroyed in 1588 but that, instead, Spain had conquered England. What would the world be like today if that had happened?

Sam: Well, we would all be speaking Spanish.

Peg: We might have fought a revolutionary war against Spain instead of England.

Tom: We might have a state religion in this country.

These examples represent teacher-stimulated divergent thinking, but it need not always be teacher-generated. In a regular discussion of the "spoils system" a student may generate the following:

Pete: Well sure, the spoils system might be a good thing when a political party is getting started, but what about when there's no party system--like in the United Nations?

Here the student reveals his ability to take off from an established fact or facts and see further implications or unique associations that have not been requested, or perhaps even thought of, by the teacher. Instances of this type of self-initiated student behavior would also fall under the general category of divergent thinking.

Evaluative thinking deals with matters of judgment, value and choice, and is characterized by its judgmental quality. For example:

T: What do you think of Captain Ahab as a heroic figure in Moby Dick?

Bob: Well, he was sure brave, but I think he was kind of mean the way he drove the men just because he had this crazy notion of getting back at Moby Dick.

T: Is it likely that we will have a hard winter?

Mary: Well, I think that the pattern of high pressure areas suggests that we will.

T: Who was the stronger President, Jackson or Adams?

Mike: Adams.

In the first of the above examples, the student is asked to construct a value dimension of his own in terms of what he considers "heroic," and then to make a judgment as to where on this value dimension he would place Captain Ahab. In the second response, the student is asked to make an estimate or to give a speculative opinion or assessment of probability. A third possibility, not illustrated here, involves entering a qualification or disagreement, wherein the respondent would offer a modification of a prior judgment of another student; or he may state a counter-judgment, in which he declares direct opposition to the statement of the previous speaker.

The final major category is Routine. This category includes routine classroom procedural matters such as management of the classroom, the structuring of class discussion and approval or disapproval of the idea or the person.

Included here are the attitudinal dimensions of praise and censure of others and of self. Also present are dimensions of structuring, a kind of prefatory remark, telling in advance what the speaker intends to say or do, or what he expects someone else to say or do. Other characteristic occurrences, such as humor, as well as the ordinary, "routine" classroom management behaviors--even to requests to close the door or asking what time it is--are included in this general category.

A short description of secondary categories in the classification system can be seen in Table 5. These were derived empirically by studying the classroom performance of students and teachers. Examples were extracted that seemed to differentiate certain behaviors from other types of behaviors. These were then labeled appropriately and placed in their their proper preliminary categories which were derived from the Guilford

TABLE 5

Secondary Classification Categories

I. ROUTINE (R)

This category includes routine classroom procedural matters such as management of the classroom, the structuring of class discussion and approval or disapproval of the idea or the person.

MANAGEMENT

Mq - Question: Requests or invitations to speak; calling for questions, as in "Anybody have a question?"

Mp - Procedure: Announcements or procedural instructions, given or requested for individuals or the group as a whole.

Ma - Aside: Incidental or parenthetical comment; gratuitous content.

Mnc - Nose-Counting: Calling for or responding with a show of hands for a tally or canvass.

Mfb - Feedback: Request for or response with signs from group as to whether or not the speaker's actions or remarks are clearly understood.

Mw - Work: Non-verbal actions or seatwork going on in connection with current discussion or class proceedings.

X - Unclassifiable response primarily due to technical recording difficulties.

STRUCTURING

Sts - Self-Structuring: Conventional prefatory move to signal content and purpose of one's own next remarks or behavior

Sto - Structuring Other(s): Engineering next speech or actions of other(s). Monitoring other's performance. Pump-priming to keep discussion going on a point already before the class.

Stf - Future Structuring: Forecast of future activity, study, learning, etc. beyond this particular class session.

Stc - Class Structuring: Focusing class attention on point to be emphasized or taken up; laying groundwork for question or problem; probing, pushing, adding data for bogged-down class (teacher only).

VERDICT

Ver - Verdict: (+or-) Impersonal praise or reproach on quality of academic performance of individual or group.

Verp - Personal Verdict: (+or-) Personal praise or reproach of individual. (Occasionally by T on whole class) Negative Verp generally on deportment.

Agr - AGREEMENT: (+or-) Acceptance or rejection of content; conceding a point; not permission-giving nor procedural.

S - SELF REFERENCE: Speaker's personal report or comment upon or about self. Often conventional device; cautionary tactic.

Du - DUNNO: Explicit indication that one does not know.

Mu - MUDDLED: Speaker confused, mixed up, flustered.

Hu - HUMOR: Remark of evident witty, humorous, or comic intent; response (usually laughter) to same.

II. COGNITIVE-MEMORY (C-M)

C-M operations represent the simple reproduction of facts, formulas and other items of remembered content through use of such processes as recognition, rote memory and selective recall.

Scr - SCRIBE: Giving a spoken or written spelling or exemplification of a work or expression.

RECAPITULATION

Req - Quoting: Rote recitation or literal reading from text, paper or notes in hand.

Rep - Repetition: Literal or nearly verbatim restatement of something just said.

Rec - Recounting: Narration of past extra-class occurrence.

Rev - Review: Recitation of material which occurred or was discussed in current or past class session.

CLARIFICATION

Clm - Clarifying Meaning: Rendering a previous statement more intelligible either by (a) restating or rephrasing or (b) adding informative details.

Clq - Clarifying Qualification: Render a previous statement more accurate either by (a) "Entering a rider" upon the remark or (b) entering an explicit correction.

FACTUAL

Fs - Fact Stating: Requests for and recitations of items taken to be matters of fact.

Fd - Fact Detailing: Spinning out further a prior assertion of fact or other statements (As, Exr) in which factual items were mentioned.

Fm - Factual Monologue: Reporting of factual material in the form of a monologue during which verbal exchange is conventionally excluded.

III. CONVERGENT THINKING

Convergent thinking is thought operation involving the analysis and integration of given or remembered data. It leads to one expected result because of the tightly structured framework which limits it.

TRANSLATION

Tr - Translation: Shift of conceptual material from symbolic or figural content to semantic, or vice versa.

ASSOCIATION

As - Association: Involving likenesses and differences; degrees of comparison; and relationships of direction, spatial position and/or classification, etc.

EXPLANATION

Exr - Rational Explanation: Asking or telling why X is the case; why Y caused X, etc. Substantiating a claim or conclusion by citing evidence.

Exv - Value Explanation: Asking or telling why X is good, bad, useful, important, etc. Justifying a rating, viewpoint, or value-based judgment by giving reasons why.

Exn - Narrative Explanation: Step-by-step account of how something is done, how a mechanism works, or of what led up to an event or given outcome.

CONCLUSION

Gen - Generalization: Integration of prior remarks by slightly more general reformulation.

Cons - Summary Conclusion: Summary reformulation, often serial or enumerative, of material treated in discussion or reading.

Conl - Logical Conclusion: Calling for a deductively drawn implication from material presented.

IV. EVALUATIVE THINKING (ET)

Evaluative thinking deals with matters of value rather than matters of fact and is characterized in verbal performance by its judgmental character.

UNSTRUCTURED

Ura - Unstructured Rating: A value judgment produced or requested on some idea or item in terms of a scale of values provided by the respondent.

Uju - Unstructured Judgment: A value judgment produced or requested on some idea or item wherein the value dimension has already been provided.

STRUCTURED

Svp - Structured Probability: An estimate or speculative opinion is given or requested as to the likelihood of some occurrance or situation.

Svc - Structured Choice: Speaker calls for or declares his position as a choice between alternatives (not between Yes or No answers).

QUALIFICATION

Qj - Qualified Judgement: An offer or request for a rider or modification to a prior value judgment. Also, attempts to make more precise the value dimension discussed.

Q-c - Counter Judgment: Speaker declares a directly opposed position with respect to value statement of a previous classroom speaker.

V. DIVERGENT THINKING (DT)

In a Divergent Thinking sequence, individuals are free to independently generate their own ideas within a data-poor situation, often taking a new direction or perspective.

El - ELABORATION: Structured or free (s or f). Building upon a point already made; filling out or developing a point, but not shifting to a new point, often by concocting instances or examples.

Ad - DIVERGENT ASSOCIATION: (s or f) Constructing a relationship between ideas, casting the central idea into sharper and often unexpected perspective, by comparisons, analogies, etc.

Imp - IMPLICATION: (s or f) Extrapolation beyond the given, projection from given data--typically by antecedant--consequent or hypothetical construction--to new point(s) of possibility.

Syn - SNYTHESIS: Spontaneous performance, tying in, integrating the current central idea with an entirely new point or frame of reference. May be a variation or reversal of a previous conclusion.

Double Paired Ratings: The complex nature of verbal classroom interaction often requires the combination of more than one of the above described categories.

The full classification system and instructions are presented in a supplementary publication ASCHNER-GALLAGHER SYSTEM FOR CLASSIFYING THOUGHT PROCESSES IN THE CONTEXT OF CLASSROOM VERBAL INTERACTION, Urbana, Ill. University of Illinois, 1965.

system. The final organization of the secondary categories under their major headings is seen in Table 5.[1]

The evolution of the category system can be viewed in two major steps. During the initial stage of development of the system, project members concentrated on finding bits of behavior in tapescripts that did not seem to fit into the established categories. These new behaviors, if they seemed important enough, would be made into new categories, distinctive definitions constructed, and then would be placed under their appropriate primary category. This approach, while interesting and instructive to the staff in terms of how many variations of intellectual operations could be obtained in a classroom setting, became unwieldy and unmanageable from the standpoint of obtaining consistent judges' ratings. The distinctions became too fine. It appeared, upon further consideration, that clear distinctions can be made between various cognitive performances in children without such distinctions having important psychological or sociological meaning. The second stage in the evolution of the final project classification system was to condense and eliminate a number of categories that did not seem to have utility for the final analysis. For example, we developed several categories of clarification such as Cla which referred to clarification of a previous statement by adding a bit of new information and Clm which referred to clarification of a previous statement by restating already given information. This fine

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[1] Due recognition should be given here for the significant contribution made to the initial development of the classification system by Dr. Mary Jane Aschner. Much of the precise language of the definitions and the identification of secondary categories themselves, are due to the skill and perceptiveness of Dr. Aschner. Although Dr. Aschner left the project to take a position at Harvard University before its final revision in April of 1962, the classification system still contains much of her thinking and original work.

FIGURE 2

Sample Page of Classification Flowchart

HAT 1 Session

Tapescript ____________

Rater & Date ____________

Pages Covered ____________

CATEGORIES

Page No.	Resp. No.	Speaker	R	C-M	CON	EV	DIV	Notes
18	147	Coen		Clg				x interrupted
	148	T	Stc	Rev			Adf	
						Una(p)		
					A$^{\underline{s}}$			
			mq					
19	149	Robert	Du		As			
			STs		Exn			
	150	T+Robert						x interrupted
	151	T				Una		
				Clm				
	152	Robert		Em				
							Adf	
	153	T	Ver+					
	154	T	Ver+				Adf	
				Rev	(A$^{\underline{s}}$)			
			ma			Suc		
	155	Robert	Agr+					

distinction, while often observable, did not seem to have important meaning in pedagogy and the two categories were collapsed into one general clarification (Cl) category.

In a similar fashion, numerous other categories were eliminated or combined so that the final version of the classification system was reduced by approximately 25% from its high water mark of categories in 1961 before the final analysis was carried out.

Figure 2 is a sample of the flow chart used in the current project to classify thought processes. Each of the class sessions of approximately one hour produced between 30 to 50 pages of double-spaced manuscript. These flowchart pages cover about one page of that transcript.

In this first session of this social studies class, HAT 1, the subject under discussion was the resistence of natives to colonization of this land. Statement response #147 by Coin is a Clarifying Qualification (Clq) in which he adds a correction to a previous statement by the teacher. Response #148 includes a wide variety of teacher behavior. It shows the teacher structuring (Stc) the class as to what would be discussed next, asking for review (Rev) of information in an area of American History that they had previously studied, making a unique divergent association (Adf) of his own, then making a rating (Urap) on how well the class was doing on their assignment, and finally ending asking for a convergent association (As).

Robert, in response to the teachers question, in response #149 first states that he does not know (Du), then announces what it is he is going to talk about (Sts), gives a convergent association (As), and follows that with an explanation for his previously given association (Exr). In statement #151, the teacher gives an evaluative rating of his own (Ura) and then clarifies the previous statement made by Robert (Clm). In #152, Robert launches into a factual monologue (Fm), punctuated with a divergent association (Adf). The teacher expresses praise in a positive verdict on Robert's performance (Verd), gives a divergent association himself (Adf), repeats the association question in statement #148 (Rep), finally asks the students to make a decision--an evaluative choice between two alternatives that he presents to them (Svc).

After becoming familiar with the category system it is possible to follow the tapescript flowchart and have a reasonably good idea as to what kinds of things were being discussed and how they were being discussed without looking at the tapescript itself.

Reliability - How reliable is the classification system? To answer this question it is necessary to list briefly the procedures of classification of a tapescript.

1. A copy of the tapescript was given to each of two members of the project staff. They then independently classified each teacher and student statement on a flow chart. (Earlier in the project history there was an additional initial step of breaking the statements into thought units prior to actual classification. Later on, these two steps were combined into one.)
2. The two staff members then met and compared their ratings. On those statements where there was a discrepancy they tried to reach a consensus. This was relatively easy to do in many instances where the one judge could see that he had overlooked an obvious point. (The establishment of a set in all the judges that tended to bias them into overrepresenting or underrepresenting certain categories while classifying was one of the permanently unsolved problems. This consensus meeting was extremely important to counteract such sets.)

3. On those few statements where the judges could not reach agreement another step was taken. The full project staff (anywhere from five to seven persons) would have a general meeting and discuss the items and reach a decision on the classification.

While the use of consensus of individual judges would appear to stabilize the judgment to some extent, there remained a possibility that one judge with a strong personality or a particular point of view could sway the judgement of the team or even the larger group when discussing particularly difficult ratings.

One class session, Idea 3, was selected because of the variety of responses present to indicate the degree of consistency in the use of this procedure with the classification system. Two teams operating independently, classified and consensed the entire session. These consensed judgments were then compared as shown in Table 6. The Routine category was omitted from the comparison since it did not figure in the data report of teacher or student class performance. The two teams gave essentially the same percentage allotment to the major categories. Team 1 rated 62% of the total responses as Cognitive Memory whereas Team 2 rated 58% of the items as Cognitive Memory; Team 1 rated 14% of the items Convergent Thinking and Team 2 rated 17% of the items Convergent Thinking.

It may be noted that tht total number of ratings in the Cognitive memory area was different for both teams. This was because Team 2 apparently divided the statements into finer subcategories than Team 1. An example of such a rating can be seen in the following teacher statement:

T: All right. Now, does this present--if this is the case, then (several words inaudible) what we put on the board we should all consider tentative, that is, not final. -- Because you probably gained this information from a single source and there are many reasons why a single source of information may not be accurate. It may be your interpretation of it-that-which another-going to another source might clear up or it may be that-simply that the particular book that you are using is not accurate. Now, let me ask, what kind of problem this could present, possibly, to the colonists--if the House of Burgesses - if the members of the House of Burgesses were elected by the Supreme Council in London. What kind of thing might you have? Leland?

Consensus Team 1 saw in this statement structuring of the class (Stc), rational explanation (Exr) and a request for implications (Imps). Team 2 agreed with all of the categories seen by Team 1 but in addition, saw a pedagogical rating (Urap) so that Team 2 had four ratings for this one statement whereas, Team 1 had only three. This and similar minor differences would result in the different totals shown in Table 6.

Table 6

Amount of Agreement by Two Consensus Teams Classifying One Session (Idea 3)

	Team 1		Team 2	
Category	N	%	N	%
Cognitive-Memory	126	62	132	58
Convergent Thinking	29	14	38	17
Divergent Thinking	20	10	17	7
Evaluative Thinking	29	14	42	18
TOTAL	204	100	229	100

Total statements rated - 296

Total agreement - 231

Percent agreement - 78%

On the 296 statements made by teachers and students, the total agreement for the statements between the two teams were obtained on 231, for a percentage agreement of 78. In this instance, agreement represented either complete agreement by the rating teams or agreement on two out of three, three out of four or four out of five of the categories. This represented rather strict criteria since in those instances labelled as 'no agreement' there was matching judgments but not to the level of the criterion set there.

Hutchison (1963) in a test of reliability of the primary categories for the classification system had compared the performance of two judges over 1,037 statements obtained over 90% agreement in primary categories on the classification. These results gave some confidence that the classification system, if utilized by the procedures described here, can provide reasonable consistency from one set of judges to another.

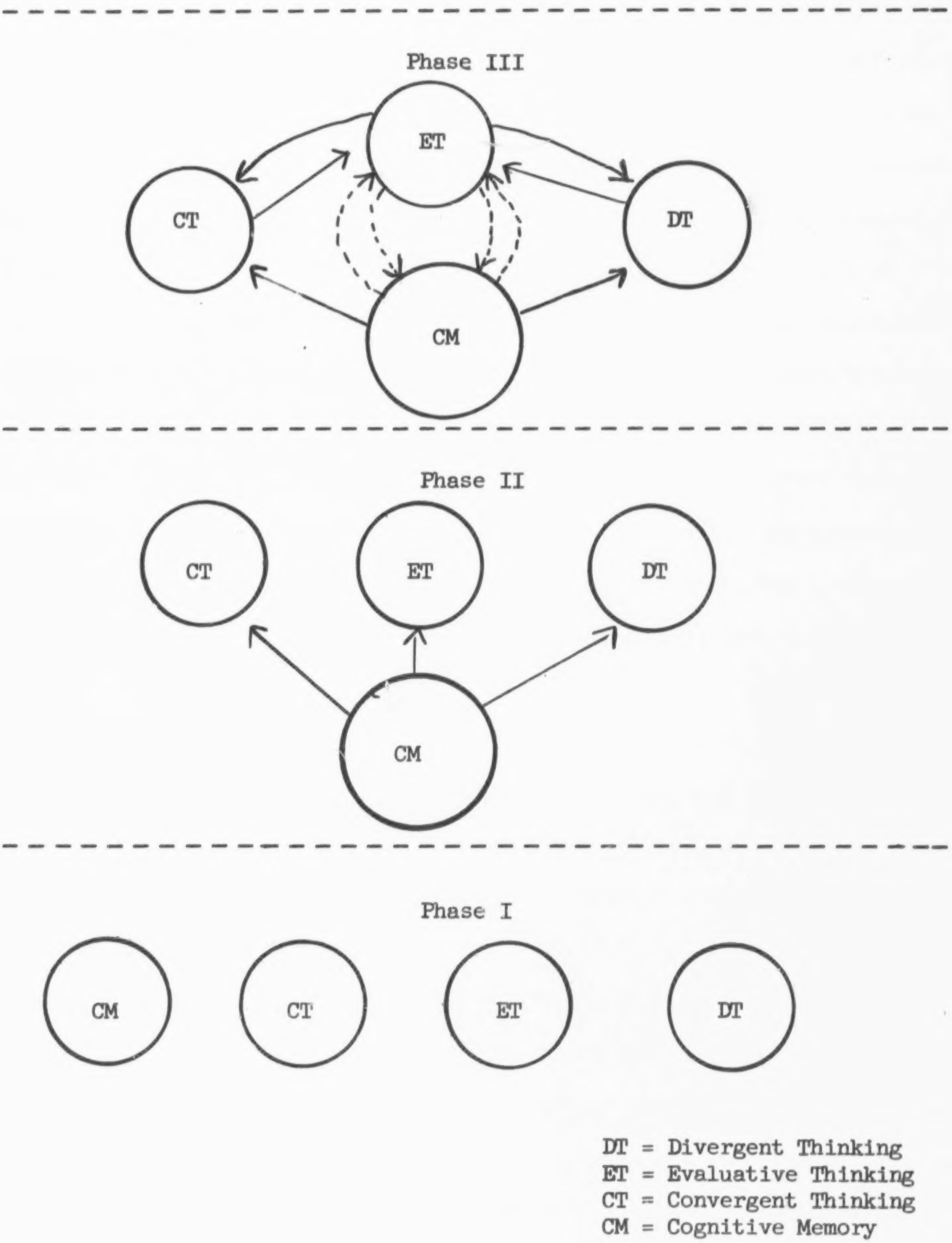
The Changing Models.

In any such lengthy project as the one reported here, it is not uncommon for the basic thinking to evolve and change as greater experience is obtained with the data. Some changes have taken place in the theoretical model which initially formed the foundation for the development of the classification system.

Figure 3 shows the general evolution of the model of cognitive operation for the project. Phase I represented the project orientation during the initial planning stages. The four major areas, Cognitive-Memory, Divergent Thinking, Convergent Thinking and Evaluative Thinking were seen as separate entities more or less independent of one another. Thi concept stems directly from the "structure of intellect" model obtained from the factor analytic studies of Guilford.

FIGURE 3

Changing Project Views of Cognitive Operations in the Classroom


Phase III
ET
CT
DT
CM
Phase II
CT
ET
DT
CM
Phase I
CM
CT
ET
DT
DT = Divergent Thinking
ET = Evaluative Thinking
CT = Convergent Thinking
CM = Cognitive Memory

It soon became apparent that while it might be possible to isolate these various areas of intellectual operation in the laboratory situation that it was extremely difficult to separate them in the more amorphous enviroment of the classroom. In this sense, this is not very different from a laboratory situation in which, under special conditions, certain chemical elements can be extracted from their enviroment although they would never be found in the free state on planet Earth.

In the classroom situation, the dependency of productive thinking (convergent, divergent and evaluative thinking) on memory in dealing with specific problems is obvious. For instance, the request to develop solutions which would solve the "Wombat problem in Southern Australia" can bring forth blank stares from any group of persons regardless of how intelligent or how productive they are generally. This is because productive thinking relies on the prior absorption of much fundamental information about the subject matter under consideration.

This realization caused a change in the model from Phase I to Phase II. In this phase the productive thinking areas were seen as being relatively independent of one another, but relying upon Cognitive-Memory as the basis for the productive operations (See Figure 4).

Further experience with this second model and with attempts to classify behavior in the classroom into various areas of intellectual operation led to another modification which can be seen in Phase III. In this instance it was generally concluded that Evaluative Thinking has to rely rather heavily not only upon Cognitive-Memory but also on either Convergent or Divergent Thinking. For instance, one type of evaluative question could be, "Do you consider Communist China a major threat to the United States?" The answer of the student would be an evaluative one in the sense that the student is required to construct a value dimension ranging from threat to non-threat and then to make a judgment as to where on this continuum to place Communist China.

But, if one examines how a student arrived at such an evaluative statement it can be readily seen that he had to do convergent thinking to develop a closely reasoned and logical process leading to his conclusion; or he had to produce examples constructed from his experience or imagination which would justify or illustrate the particular value judgment he finally makes.

In the typical classroom, the value judgment is asked for first and then justification is often requested (Why do you hold this position?) as supporting information for the conclusion. In some instances, it is quite possible that an individual can come to some conclusion without necessarily being able to justify it through a closely reasoned argument. Thus, a student can say, 'I think that China is a great threat.' but still not be able to present reasoned arguments or examples which would lead to such a conclusion. In other instances, as in the area of mathematics, it is possible to come to a conclusion or solution to a problem without being able to produce the necessary process which led the student to the result. Such thinking is usually labeled as intuitive and the role that this process plays in productive thinking is one of the most important areas for further investigation.

The evolution of the model of cognitive operations has been carried through three phases, all of which have maintained the operations of the Guilford model as the key parameters. However, further exploration and struggling with the classification problems suggested that there may be some fundamental difficulties with this use of the "Structure of intellect" model itself. As an example, the judges who were forced to rate each statement by teacher and student according to the classification system had considerable difficulty distinguishing between instances of *Conl* (logical conclusions) and *Impf* (divergent implications). This is an important distinction since one of these is a key category in the *convergent thinking* area while the other would be an important aspect of the *divergent thinking* operation. Similar difficulties were found between convergent association and divergent association and the problems of making these differentiations finally led to some serious reconsideration of the basic model of cognitive operations.

Suppose a person is asked to solve a problem, "If a train is traveling at 60 miles per hour going to a town 150 miles away, how long would it take to get there?" This type of problem would be classified as a request for a logical conclusion (*Conl*). The student is expected to follow a standard logical sequence of operations to obtain the one correct answer and this can be identified as belonging to the area of convergent thinking. But suppose we ask the student to answer the question, 'What would happen if people lived to be 200 years of age?', a question classified in the divergent thinking category, and he answers, 'Everyone would starve.'; How does he reach such a conclusion? He must have started with the *same* logical syllogism and operations that he used to solve the arithmetic reasoning problem. He would say 'If there is an unlimited population because of everyone living so long, and a limited food supply, then it follows that people would starve.' It is true that the problem as constructed allows the development of a large number of such syllogisms but the mental *operation* by which one reaches the solution to the problem apparently remains *identical* with the convergent problem.

Once this was realized, much of the difficulty in obtaining agreement between judges on these distinctions became more understandable. Viewing the problem from the standpoint of mental operation, the differences between the process followed by the student was often hardly distinguishable from divergent to convergent. The difference lies in the style of question and in a strategy of selection of one answer from a number of alternatives in the divergent thinking problem. There would seem to be a genuine question as to whether divergent thinking deserves separate categorization as a distinctive cognitive operation or whether it merely represents a distinctive cognitive style or set.

Once this particular line of thought was established it became clear that the distinction between the operation of evaluative and convergent or divergent thinking also became dubious. For instance, given a particular statement that, "Jones is a good mayor," which is certainly an evaluative statement, one can then ask what mental operations were involved. It appears that it, too, must follow the same syllogistic reasoning. The student says, in effect, given a certain criteria for a good mayor, and given further the fact that Jones meets these criteria, ergo Jones is a good mayor. So the same basic mental operations were followed in each of the convergent, divergent and evaluative thinking examples. The question then seemed to be, was the difference mainly in how the problem was posed, rather than in the mental operation that was followed?

Since divergent thinking has been linked with creative abilities this would raise the further question as to what special cognitive operations are required in creative abilities? Among those who feel that the differentiation between creative thinking and problem solving is overdrawn are Newell, Shaw & Simon (1962). They concluded that "creative activity appears simply to be a special class of problem solving activity characterized by novelty, unconventionality, persistance and difficulty in problem formulation." These authors have demonstrated this point by programming a computor to do some problem solving activity that is very difficult to distinguish from creative thinking. Among other things, they developed the Logic Theorist which enabled them to reproduce theorems in Principia Mathematica, generating these theorems merely from the information previously available and in much the same way that Whitehead & Russell must have produced their creative work. They have also devised computor programs for music composition, the design of electric motors and chess playing, among others.

All of these considerations led to a new organization of sub-categories which was not constructed more along the lines of mental operation that could be more clearly distinguished. These four categories were conclusion statements, reasoning statements, association statements and factual or memory statements. An attempt was then made to reanalyze the data along these dimensions as well as those that fit in with the original planning based upon Guilford's constructs.

Measuring Instruments.

The choice of measuring instruments in a research study probably is as crucial as any other single decision. Since the investigation of the in-class performance of students has been relatively infrequent, there were few guidelines available to influence this choice.

The few available studies suggested that the important factors influencing class performance fell in the area of attitude, personality development, and cognitive style. In other words, the concepts to be measured were in areas that have not been noted for highly reliable or valid measuring instruments. Nevertheless, for an exploratory experiment it was decided to sacrifice some degree of preciseness and reliability in order to approach as closely as possible those variables that seemed to be pertinent. Thus, in addition to the school-obtained IQ scores and achievement measures, the measuring instruments involved in the present study attempted to examine cognitive style, attitudes and values.

Cognitive Style. While it is well-known that IQ scores are highly predictive of the performance of the individual in an academic setting, it is not the only useful predictor. When the children being considered have a relatively narrow range of IQ scores, as in the gifted groups in the present study, then other factors assume a more important role in the prediction of individual differences in classroom performance. Thus, it was necessary to look for other tests which do not correlate highly with IQ but which seem to be related to classroom performance. The Uses and Consequences tests used in the present study are adaptations of those proposed by Guilford (1956).

In his factor analyses of tests he generally found performance on certain tests to load highly on a factor called divergent thinking. Guilford considered this factor to be closely related to creative abilities. Both the Uses and Consequences tests have been used in other factor analytic studies and seem to load significantly on this divergent thinking factor (Kaya, 1960 and McGuire, et al., 1961). In addition, other studies have indicated (Getzels & Jackson, 1962; and Torrance, 1962) that performance on these tests does relate to academic achievement.

The Uses Test. As originally devised, the Uses test was composed of six questions for which the student was given a total of ten minutes for each question (Kettner, Guilford, & Christensen, 1959). In the present project the time limit was reduced to four minutes and the test itself reduced to three questions. These changes were introduced to fit the present sample and the time allotted in the total battery. Two sets of three questions each were devised, but the basic form for the Uses test was unchanged. The subject was asked to list as many uses as he could for a given object or a given activity. Subjects were assured that there were no right answers and were asked to make as many responses as possible during the four minute period.

Since it had been shown that changes in time and instructions have an influence on the test results (Christensen, Guilford & Wilson, 1957; Gold, 1963) the precise instructions for the test used in this study are given below:

> WE OFTEN BECOME SO USED TO USING CERTAIN ARTICLES IN SPECIFIC WAYS THAT WE FORGET THAT THEY CAN BE USED FOR MANY OTHER PURPOSES ALSO. FOR EXAMPLE, A SHOE COULD BE USED TO DRIVE A NAIL OR A MAGNIFYING GLASS CAN BE USED TO START A FIRE. ON THE FOLLOWING PAGES YOU WILL HAVE A CHANCE TO THINK UP SOME OF THE DIFFERENT WAYS THAT CERTAIN FAMILIAR ARTICLES COULD BE USED.

In the present project, three major scores were obtained from the Uses test; fluency, or the total number of responses given to three questions; breadth, or the total number of general categories used (i.e , one use for brick would be 'building a garage' which would be in the general classification of "Construction". Another use given could be 'To hit someone', which would classify it as a weapon. The total number of classifications used represents the breadth score.) and flexibility, measures the number of shifts from one classification to another when the subject's responses are read in the order that he listed them.[1]

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[1] The scoring standards for the Uses Test can be noted in Appendix A.

The scoring system for the Uses test in the present study was developed on a more or less trial-and-error basis using general test protocols that were not a part of the current research analysis and progressively refining the categories through staff discussion and successive tryouts. Two trained judges rated the same 100 cases and the inter-judge reliability score over fluency, breadth and flexibility was .99. Thus, there was every reason to believe that the scoring system itself could be applied by any trained judge.

Table 7 shows the stability over time of ideational fluency (as measured by the Uses test) as a personal characteristic in some of the present groups. In the first instance, one class of twenty four students was given the same form of a test with a time lapse of 2 months and obtained a test-retest correlation of .77.

TABLE 7

The Stability of 'Fluency' as a Personal Characteristic

USES TEST - Fluency

Group	Time Lapse	N	r	Forms
ABLE	2 mos.	24	.77	A&A
JACK-KING	1 yr.	53	.46	A&B

With the introduction of different forms of the test, the test-retest correlation over a period of one year with 53 subjects in the present experiment obtained a correlation of .46.

Those reliability and stability coefficients are generally comparable to those obtained in other studies. While they did not reach the reliability level of instruments such as achievement tests, it must be pointed out that the characteristics being measured here, depending upon attitude and cognitive style, would be expected to fluctuate from one time to another in the same individual.

The Uses questions in set A were as follows:

1. List on the paper all of the uses you can think of for a brick.
2. List all of the things you can think of that might bring comfort if you were hot.
3. List how many ways water can be made to work for you.

The questions for set B were:

1. List all of the uses you can think of for a newspaper.
2. List all of the things that might bring you comfort if you were cold.
3. List all the uses you can think of for a screwdriver.

The Consequences Test. The consequences test has received prominant use in various test batteries investigating productive thinking or creative abilities. In this case, a group of three questions was used with the subject having four minutes to respond to each. The subjects were given the following instructions.

> INVENTIONS SUCH AS THE AUTOMOBILE AND TELEVISION OFTEN CHANGE OUR LIVES IN MANY WAYS ASIDE FROM THEIR ORIGINAL USE. FOR EXAMPLE, THE AUTOMOBILE HAS CHANGED THE DATING HABITS OF OUR YOUTH AND TELEVISION HAS BECOME USED AS A TYPE OF BABY SITTER FOR OUR CHILDREN. IT IS FUN TO TRY AND THINK ABOUT WHAT EFFECTS MIGHT BE PRODUCED BY OTHER FUTURE CHANGES.

The first form of the Consequences test used the following questions:

1. What would happen if pills were developed which would substitute for food?

2. What would happen if everyone were born with three fingers and no thumbs?
3. What would happen if the average temperature for this area rose 15° all year round?

The second form of the Consequences included the following questions:

1. What would happen if everyone in the world suddenly lost their hearing?
2. What would happen to Illinois if it rained six months out of the year?
3. What would happen if everyone lived to be about 200 years old?

The scoring standards used for the Consequences test were a matter of considerable concern of the project staff. A large number of attempts were made to devise a 'quality' score but each had to be abandoned due to a lack of inter-judge reliability in scoring. Finally, four scores were derived from the test which could receive inter-judge correlation of .90 and above.

a. fluency, or the total number of responses given.

b. breadth, or the total number of general categories used (these categories, similar to the Uses test, were developed by the use of protocols that were generally not directly involved with the research analysis through successive trials and discussions by the project staff).

c. problem-solution, one of our earlier observations was that children had different styles of responding to the Consequences test relating to the type of answer produced. Some children would concentrate on giving the number of problems that would result from a given condition whereas other children would

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concentrate on ways of solving these problems. Thus a ratio score was obtained of the total number of answers given to the number of solutions.

d. Finally, there was a personal-nonpersonal score in which the subject was scored as to whether he was inserting himself into the answers such as "I would go hungry" as opposed to "People all over the world would go hungry."

Recent work by Guilford, Merrifield & Cox (1961) confirm that these tests used in the present study are closely related to two components of divergent thinking, i.e., ideational fluency and spontaneous flexibility. Breadth scores on the Uses and Consequences tests seem to possess high factor loadings on spontaneous flexibility, while total response scores on both Uses and Consequences weigh heavily on the general factor of ideational fluency. Previous work by Kaya (1960) indicated that the Uses and Consequences test both loaded high on a factor of flexibility in their investigations of measures of creativity.[1]

Semantic Differential.

Since the book, The Measurement of Meaning, by Osgood, Suci & Tannenbaum was published (1957), there has been continued interest in the research potential of the semantic differential technique. In this technique, the subject is given a series of concepts and must respond to each concept on a continuum of adjective pairs of good-bad, heavy-light, or beautiful-ugly, etc. He responds to the same sequence of adjective pairs for each concept.

Osgood (1962) recently summarized cross-cultural research on the semantic differential and found that when factor analyses were calculated on the results, similar factors can be found across cultures. He also commented that there is no such thing as the semantic differential but that each use depends upon the particular concepts and set of adjective pairs that are utilized.

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[1] Scoring standards for the Consequences Test can be noted in Appendix B.

In this particular study, the scale utilized (which can be seen in Appendix D) had been used in a previous research project by Pierce & Bowman (1960). They utilized the scale to compare the performance of high achieving and low achieving gifted secondary school students and were able to make a significant differentiation between both high achievers vs. low achievers and girls vs. boys. The particular manner of analysis of this scale is given in the Analysis section (see pg. 57).

Sentence Completion Test

The choice of an appropriate personality measure for preadolescent children is a difficult one. The recent accumulation of negative evidence regarding the validity of projective techniques has tempered the enthusiasm for these techniques during the past decade. On the other hand, the risk involved in using an objective scale is that the test constructor forces the subject to insert himself into the formal structure provided by the examiner, which may result in an inaccurate portrait of the subject's own world. The senior author of this report had used Sentence Completion tests in clinical situations with children and had been impressed with their usefulness in combining the more beneficial aspects of both objective and projective measures. In addition, it could:

a) be administered to large groups of children in a reasonably short period of time;

b) sample large areas of the child's self-concepts and his attitudes about the world; and

c) was open enough to allow the child to express himself freely without restricting him to a formal structure imposed around him.

The particular version used in the present study was an adaptation of the Rhode-Hildreth Sentence Completion Test (Rhode, 1957).

The sentence completion technique was originally developed by Payne (1928) and by Tendler (1930) as an adaptation of the word association method. In the particular scale used in this study, attempts were made to direct the respondent into certain areas of his enviroment by choosing stems. In the area of the family for example, the stem my mother or my father forces the respondent into comment in some way on family members.

In addition to specific content stems, such as those above, a number of stems were included particularly because of their open-ended character such as "I wish that ...." "Most of the time I ....". The scoring system adopted concentrates on the affect revealed in the responses, that is whether the response was generally negative, positive or neutral.[1] For example, the response, "My mother is often cross and irritable." would be scored as negative affect; "My mother is a wonderful person." would be positive affect; and "My mother is 5 feet 4 inches tall." would be neutral. In the present scoring system (a copy of which may be found in Appendix C) sentence stems were chosen to investigate the specific content areas of self-abilities, family, other persons and school, in addition to such abstract concepts as achievement, competition and creativity. The scoring system was based on a 7 point scale ranging from '++' in high positive affect to '--' in high negative affect. The judge read the entire protocol, placed the number of the item which referred to the particular characteristic and then rated that characteristic.

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[1] The author would like to express his indebtedness to Dr. Robert Smith for his invaluable contributions to the development of the scoring system and the items used in the present study.

In order to investigate inter-scorer reliability, twenty randomly chosen protocols were taken from the experimental group. Two judges familiar with the scoring manual independently scored these twenty protocols. As Table 8 indicates, this sample yielded a total of 460 possible categories for which some affect valence was to be assigned. The judges agreed on the direction of the valance 93% of the time. The judges agreed on identical valence 73% of the time and disagreed by one valence step only 24% of the time. The two judges disagreed by two or more valence steps on only 15 of the 460 statements or only 3% of the time. These results were taken as establishing good scoring reliability for the test itself. It was the individual's raw scores for the various items that was used in the component analysis and multiple regression analysis discussed later.

Studies on the general test validity and reliability of Sentence Completion measures have been completed by Rotter (1951) and by Rhode (1957). In these reports, validity coefficients ranging from .61 to .82 were obtained (generally by using the score of expert raters correlated with Sentence Completion scores.) **Hiler** (1958, 1959) also found significant relationships using the Sentence Completion test as compared with an objectively scored attitude scale and was able to distinguish between early terminators and long-term psychotherapy clients using a sentence completion scale. Similar favorable findings were reported in test-retest reliability, stability and inter-score reliability.

TABLE 8

Interscorer Valence Agreement for Sentence Completion Test[1]

Type of Agreement for 23 Categories	N	%	Range of Percent
Two judges agree on the valence direction	426	92.6	75% - 100%
Two judges agree on an identical valence	335	72.8	50% - 90%
Two judges disagree by one valence step	110	23.9	10% - 50%
Two judges disagree by two or more valence steps	15	3.2	0% - 10%

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[1] Taken from Smith, R., Perceptions of self, others and certain environmental aspects of high and low divertent intellectually superior children. Unpublished doctoral dissertation, University of Illinois, 1962, p. 35.

Teacher Ratings

Teacher ratings were obtained on all of the students involved in the present project. These ratings were concentrated on certain dimensions that would seem to be related to the theoretical structure underlying the project (see Figure 1). The dimensions presumably most related to the divergent thinking abilities were foresight (the ability to implications) and the product of unique ideas. The variable described in the rating scale as analysis would seem to be more related to convergent abilities. The other characteristics of self-motivation, self-esteem, and sociability were chosen as potentially relevant personality and attitudinal characteristics which could be readily observable by the teacher.

Previous experience with teacher rating scales (Gallagher, 1960) suggested that in order for teachers to produce meaningful ratings, the dimensions must be reasonably specific and descriptive; that it was advisable to avoid a middle point on the scale; and further, that it was advisable to force judgment into one of the categories rather than allowing gradation of judgments. It was advisable to have a relatively small number of steps in the rating scale. A large number of steps in a scale appear to have spurious distinctiveness without representing the actual differentiation made by the teacher.

A comparison of the stability of the two major areas of the scale, cognitive and social characteristics, revealed a substantial consistency in ratings. Twenty-three children in the present sample were rated by two different teachers with a time interval of approximately one year. A correlation between the ratings of the teachers was computed as .72 for the cognitive abilities and .50 for sociability.

TABLE 9

Teacher Rating Scale Used in Present Study

I. **SELF-MOTIVATION**	1. Rarely needs encouragement. A self-starter. Often thinks up extra projects on his own.	2. Usually self-motivated. Has periods of reluctance or indifference. Bounces back quickly from these.	3. Can be roused occasionally through much encouragement, or by a project or personal interest. Otherwise tends to be apathetic.	4. Seems generally apathetic and uninterested. Does not grow excited or intrigued with classroom. Seems passive.
II. **FORESIGHT**	1. Shows generally an ability to see implications and a readiness to look for them. Almost always sees what is coming next. Insights often seem to be mental leaps forward.	2. Usually sees further implications more often than the ordinary student. Sometimes slumps into unimaginative performance.	3. Shows occasional flash of foresight. This is generally a surprise to the teacher. More often uninspired.	4. Very pedestrian. Does not think of implications or consequences related to issue being discussed.
III. **SELF-ESTEEM**	1. Supremely self-confident. Rarely, if ever, seems bothered or held back by self-doubt.	2. Sometimes shows self-doubt under stress. Usually unexpected, since he is generally considered a stable individual.	3. Seems often to express negative view of self. Occasionally brightens up under praise or favorable circumstances.	4. Shows consistently negative attitude towards self. May reveal this by giving impression of great conceit or self-admiration.
IV. **UNIQUE IDEAS**	1. Can be counted on to come up with a unique answer of good quality to many issues raised in class. Hard to stop from producing.	2. Usually comes up with some fresh ideas, but sometimes disappoints with commonplace ideas.	3. Shows occasional flashes of fresh ideas, but not consistently. Routine performance, generally.	4. Seldom or never produces a novel idea. Usually gives back what can be obtained from class, teacher or text.
V. **ANALYSIS**	1. Excels in tasks demanding analysis; draws efficiently together evidence leading to solutions. An ideal detective.	2. Good on analysis in certain tasks, routine in others. Uneven performance, but leans in productive direction.	3. Is sometimes stirred to analyze. Usually spotty in performance. Does not persist long.	4. Seems repelled by questions or situations involving analysis. Avoids them whenever possible.
VI. **SOCIABILITY**	1. Socially popular. Very active with peer group. Almost always seen in company of others.	2. Gets along well with others. Can work individually, but seems to prefer group activities (work, social) if given choice.	3. Often alone, pursuing own interests. Interacts with others when necessary. Seems to prefer being alone much of the time.	4. A loner. Spends little time with others. Comes and goes by himself; seemingly prefers it that way.

Analysis of Data

The data analysis for this project was divided into three major sections:

1. A statistical description of the classroom performance of the various teachers and classes involved in the study.
2. A correlational analysis relating student classroom performance measures to outside variables; academic, personality and attitudinal.
3. Comparative analyses among the various subgroups of the total student population, divided by sex, cognitive style, IQ scores, etc.

Descriptive.

One of the first goals of the project was to present the actual classroom performance of students and teachers as categorized by the classification system used in the present study. The performances of each student and teacher were tallied across five consecutive class sessions in the various performance categories. Proportions of the primary thought categories used in these total sessions were calculated for teacher questions, teacher answers, boys statements and girls statements for each class group. Proportions of thought processes were used to permit comparisons of one class session to another and from one group to another.

In order to provide a rough comparability on individual classroom performance across class groups, the total of each major thought category for the five consecutive class sessions for each individual was divided by the total class performance in that category. For example, if Sam had produced a total of 10 statements in the Divergent Thinking category and the total generated by his class group was 100 statements in that period, Sam would receive an index of 10/100 or 010 in that category. This adjusted classroom score would be comparable to a student in another class who had made 20 divergent statements but where the whole class had given 200 divergent statements. These adjusted classroom indices were then used as the basic classroom performance data in later component analyses and multiple regression calculations.

Correlational.

Another major project goal was to obtain information regarding possible interrelationships between classroom performance and a number of academic, intellectual and personality variables outside the classroom interaction situation. Accordingly, the adjusted classroom indices, cognitive abilities test data, personality and attitude dimensions and teachers ratings of the students were placed in a component analysis using the varimax criterion for analytic rotation (Kaiser, 1958, 1962).

The scores that were inserted in the Component Analysis for Groups A and B are shown in Table 11. The semantic differential concept scores were obtained by summing the scores over the fourteen adjective pairs. The teacher ratings were reduced from six to two on the grounds of an initial factor analysis which indicated that five of these six rating scales clustered into a general cognition factor. The difference between the Group A and Group B analyses lie in the use of the Sentence Completion scores in Group B.

A further attempt was made to identify variables related to classroom performance through a multiple regression analysis (Guilford, 1950) in hopes of generating further hypotheses regarding the relative predictive weighting of these variables. Table 11 shows the scores used in the multiple regression analysis. Each of the semantic differential concept scores in Group A were divided into the three factors noted in Osgood's factor analytic work on these scales; i.e., evaluation, potency, and activity (Osgood, 1962).

In Group A, at the junior high school age level, achievement scores were available for reading and arithmetic and were included in the analysis. In Group B each of the scales of the sentence completion test was included together with all of the teacher rating scales and the various measures of cognitive ability.

These scores were placed in a principal axis component analysis using the varimax criterion for analytic rotation. Component scores were then generated for each individual. Multiple regression analyses were then calculated with the classroom performance variables operating as dependent variables and the individual component scores as independent variables.

In other correlational analyses traditional parametric and non-parametric measures were used as appropriate.

Comparative.

A final major project goal was to conduct comparative analysis of classroom performance between recognizable subgroups within the total population. Thus, the data were analyzed and reviewed comparing performance by sex, age and cognitive style. The fundamental tool for this analysis was the 't' test, or Chi Square where a non-parametric test seemed appropriate.

TABLE 11

Scores Used in Multiple Regression Analysis

Group A

Verbal IQ
Nonverbal IQ
Uses - Fluency
Uses - Breadth
Uses - Flexibility
Consequences - Fluency
Consequences - Breadth
Consequences - Solution
Reading Vocabulary
Reading Speed
Reading Level
Reading Total
Arithmetic Grade Level

Semantic Differential

Mother - I, II, III*
Father - I, II, III
School - I, II, III
Student - I, II, III
Work - I, II, III
Competition - I, II, III
Imagination - I, II, III
Faith - I, II, III
Success - I, II, III
Love - I, II, III
Teacher Ratings
  Cognition
  Sociability

* I = Evaluation
II = Potency
III = Activity

Group B

Verbal IQ
Nonverbal IQ
Uses - Fluency
Uses - Breadth
Uses - Flexibility
Consequences - Fluency
Consequences - Breadth
Consequences - Solution

Sentence Completion

Intelligence - Self
Social - Self
Physical - Self
Internal Conflict - Self
School Performance
Fears and Anxieties
Education and Training
School
Religion
Past Experiences
Future Projections
Competition
Work
Recreation
Creativity
Family
Mother
Father
Siblings
Other People
Same Sex
Opposite Sex
Teacher

Teacher Ratings

Motivation
Consequences
Self-Esteem
Unique Ideas
Analytic
Sociability

RESULTS

The results section of this report has been organized to present data related to the specific questions posed in the statement of the problem and to other questions that emerged as the project progressed.

The major questions asked were:

1. What proportion of various thought processes were expressed by teacher and by students?
2. What were the relationships between classroom performance and outside variables?
3. What was the relationship between the cognitive performance of teacher and students?
4. Was classroom cognitive style consistent in gifted children over time and through changes of subject matter and teacher?
5. Was there consistence of cognitive expression in teacher and student behavior within a given class section?
6. What relative influence had the group, class section (time of day?) and day of week on variance of verbalized productive thought in the classroom?
7. Was sex a relevant variable on classroom expressiveness and other variables?
8. Were there differences between cognitive style subgroups?
9. Were there differences between expressive and non-expressive students?

What Proportion of Various Thought Processes are Expressed by Teacher and by Students?

Figures 4-9 are presented in the text for descriptive purposes. The tests of significance of the propositions or suggested differences presented in these Figures are given in a later part of the Results section. The graphs were constructed by taking the total responses for a given class session and dividing them into the responses in the four primary categories: Cognitive-Memory, Divergent Thinking, Convergent Thinking, or Evaluative Thinking. Responses classified in the Routine category were not considered in constructing these graphs as this category was irrelevant to the issue in question. In constructing the graphs, a distinction was made between teacher questions and teacher statements. The questions teachers ask were considered to be indicative of the type of thought processes being asked for on the part of the students. On the other hand, teacher statements appeared to represent a type of personal style in teaching.

In the graphs which report student behavior all of the statements were counted whether they were 'questions' or 'answers'. It was earlier noted in the recordings, and in the observations of the classroom sessions, that students would often ask what seemed to be questions when, in fact, they were really giving answers. For instance, if the teacher would ask the question, 'Who is one of the foremost leaders of settlers in the Carolinas?', a student might respond, 'Wasn't one of them Sir Walter Raleigh?'. This is not really a question but rather a hesitantly ventured answer. Dr. Aschner, early in the project, classified these tentatively given student responses as quanswers. It seemed that much of the question asking behavior of the student was of this nature. It was therefore concluded that it would be most representative to combine the student's questions and statements into one graph.

FIGURE 4

PROPORTION OF THOUGHT PROCESSES
ASKED FOR BY THE TEACHER

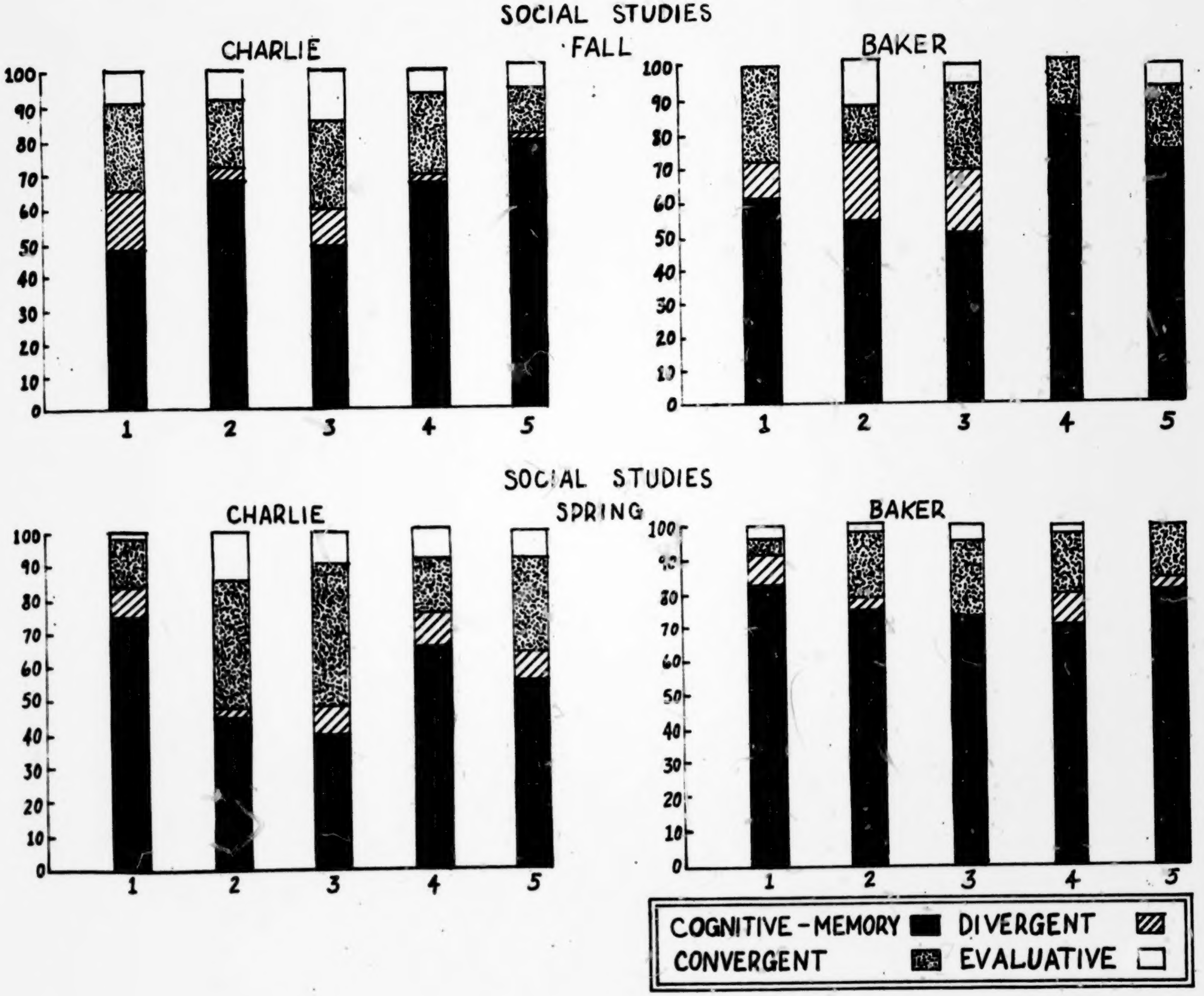


FIGURE 5

PROPORTION OF THOUGHT PROCESSES
GIVEN BY STUDENTS

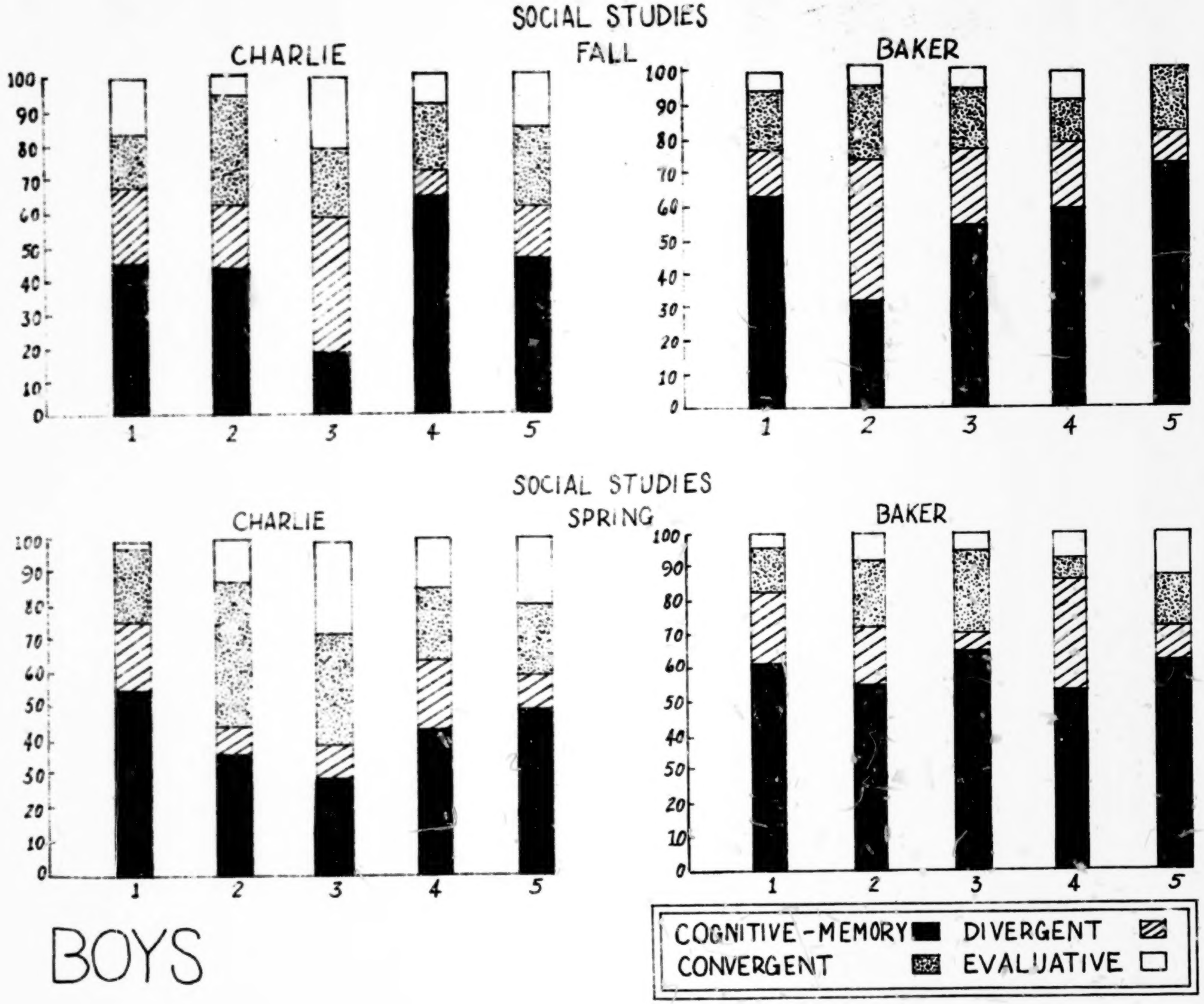


Figure 4 and 5 show the proportions of thought processes produced over five consecutive class sessions in the BAKER-CHARLIE social studies class, recorded first in the fall of the year. The same class sessions, with the same teacher, were recorded again in the following spring.

The two top graphs in Figure 4 represent the teacher questions in the fall and the bottom graphs the same type of teacher behavior in the spring. The numbers on the ordinate represent percentages of responses in the various thought categories while the numbers 1-5 on the bottom of each graph refer to the individual class sessions. For example, Figure 4 should read as follows: in CHARLIE fall session 1, the teacher asked almost 50% Cognitive Memory questions; about 15% Divergent Thinking questions; 25% Convergent Thinking questions and about 10% Evaluative Thinking questions. As can be noted, there apparently was considerable teacher variation from one class session to another and from one group to another. For example, in BAKER, Spring, the teacher was asking over 70% Cognitive Memory responses in each session whereas, in CHARLIE, Spring, the range of such questions was from 40% to over 70%. This result will be documented further in a later statistical analysis. Despite the fact that this teacher was considered to be skilled in stimulating good thinking on the part of the students, approximately 50% of the teacher questions were of the Cognitive-Memory type. This seems to be an almost inescapable average for a teacher who deals so much in detailed factual information. Even when problem solving or evaluative conclusions are the goal of the teacher, it is necessary for the students to have a broad base of information upon which to act. It is considered likely that practically all teachers observed at this grade level would produce a baseline of approximately one-half memory questions.

It can also be noted that there were some class sessions in which certain kinds of thought processes were not requested at all by the teacher. For example, in BAKER Fall 4, there were no requests for Evaluative Thinking or Divergent Thinking. In BAKER Spring 3, there were no requests for Divergent Thinking, and in BAKER Spring 5, no request for Evaluative Thinking. This result again underlines the importance of obtaining a rather large sample of observations on a given teacher, lest one should come to the unwarranted conclusion that this teacher did not utilize certain kinds of intellectual operations in his class. These results suggest that, on given days, a teacher will not ask for certain kinds of behavior, but on others, when it appears to be appropriate, he will.

Another interesting pattern can be noted in the BAKER-Fall series. There was an appreciable proportion of class time in the first three sessions taken up with Divergent Thinking. This type of thinking did not appear at all in sessions 4 and 5. In the BAKER-CHARLIE Spring sessions, however, the Divergent Thinking seems to be spread rather thinly and equally over the five sessions. This kind of observation again should warn the research person to be cautious about statements of a particular teacher's performance that are given without regard to the general flow and purpose of classroom operation at a given moment.

An inspection of the student performance in these same classes in Figure 5 compared with the teacher requests noted in Figure 4, indicates the dependence of the student proportions of thought processes upon the type of teacher questions asked. This can be particularly noted in the CHARLIE Fall sessions 1, 2, and 3 where extensive teacher requests for Evaluative and Divergent Thinking seemed to produce the highest percentage of productive responses on the part of the boys.

The performance of the boys was graphed in Figure 5 rather than that of the total student performance since all of the data related to boys and girls were calculated separately. The girls and the boys showed essentially the same proportion of responses, although not the same total output, thus the reporting of both would be repetitious.

In the area of Divergent Thinking, it was rather obvious that a small percentage of teacher requests in this area can bring forth a much larger percentage of response on the part of the students. The open-ended questions which allowed a wide variety of responses can stimulate a large number of student statements. For example, the teacher question "What would have happened if the Spanish Armada had been victorious over the English?" brought forth a veritable snowstorm of student responses along many dimensions. These figures also indicated possible differences between groups. CHARLIE and BAKER groups appear to differ in their proportion of thought processes produced despite the fact that the subject matter covered was nearly identical, with one section meeting in the morning and the other in the afternoon on the same topic.

Figure 6 presents the five consecutive class sessions of two different teachers in two different content areas of science. The DAN and EASY sections represent a course in 9th grade biology and the FOX and GEORGE series represent a 10th grade class in physics. The proportions of thought processes requested by teachers confirmed general expectations. There did seem to be a greater tendency for teachers in these science courses to concentrate on Cognitive-Memory and Convergent Thinking rather than in the Divergent and Evaluative dimensions. It may also be noted that there did not seem to be as much teacher variation from one class to another as was true in the case of the social studies teacher as indicated

FIGURE 6

PROPORTION OF THOUGHT PROCESSES
ASKED FOR BY THE TEACHER

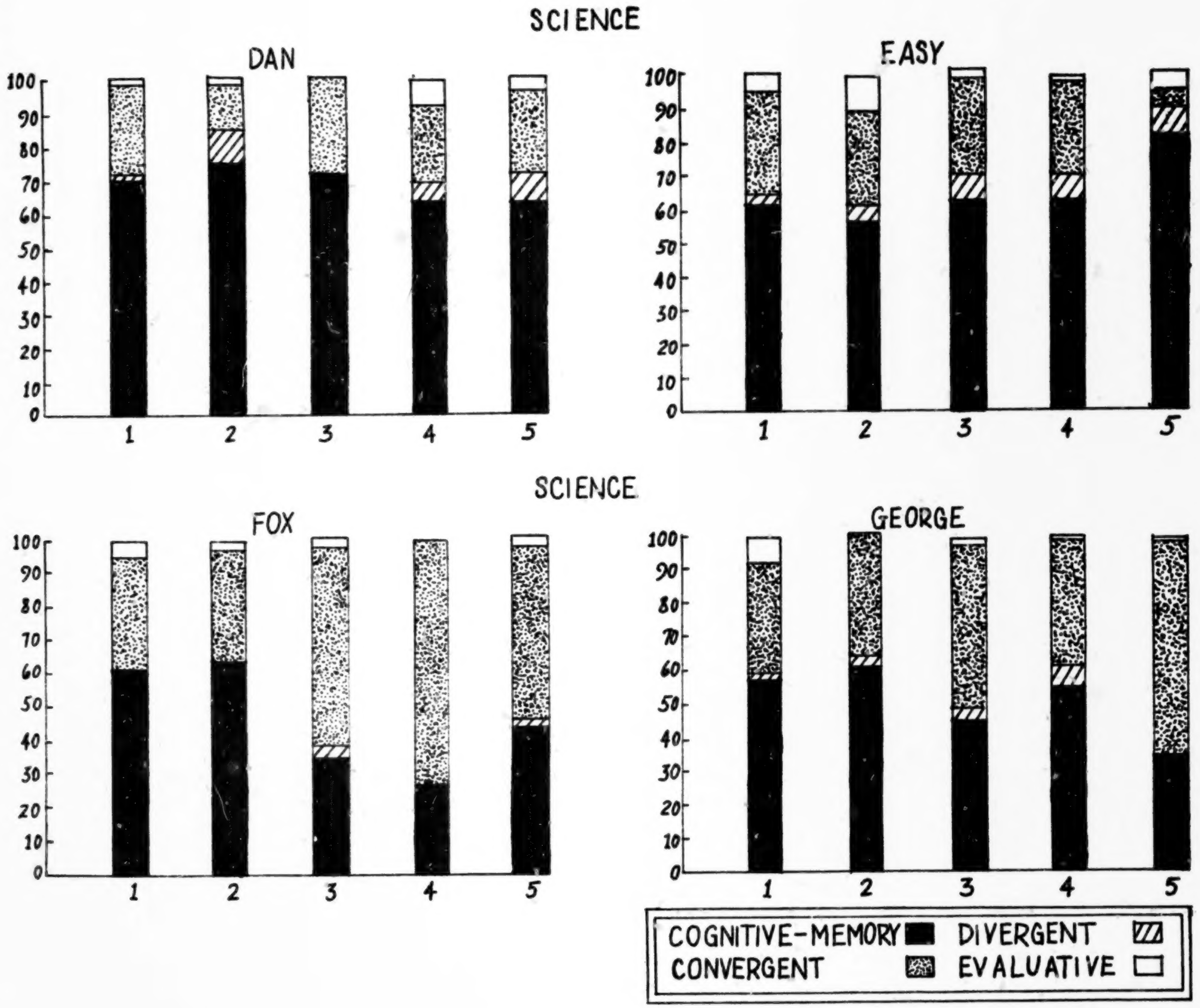
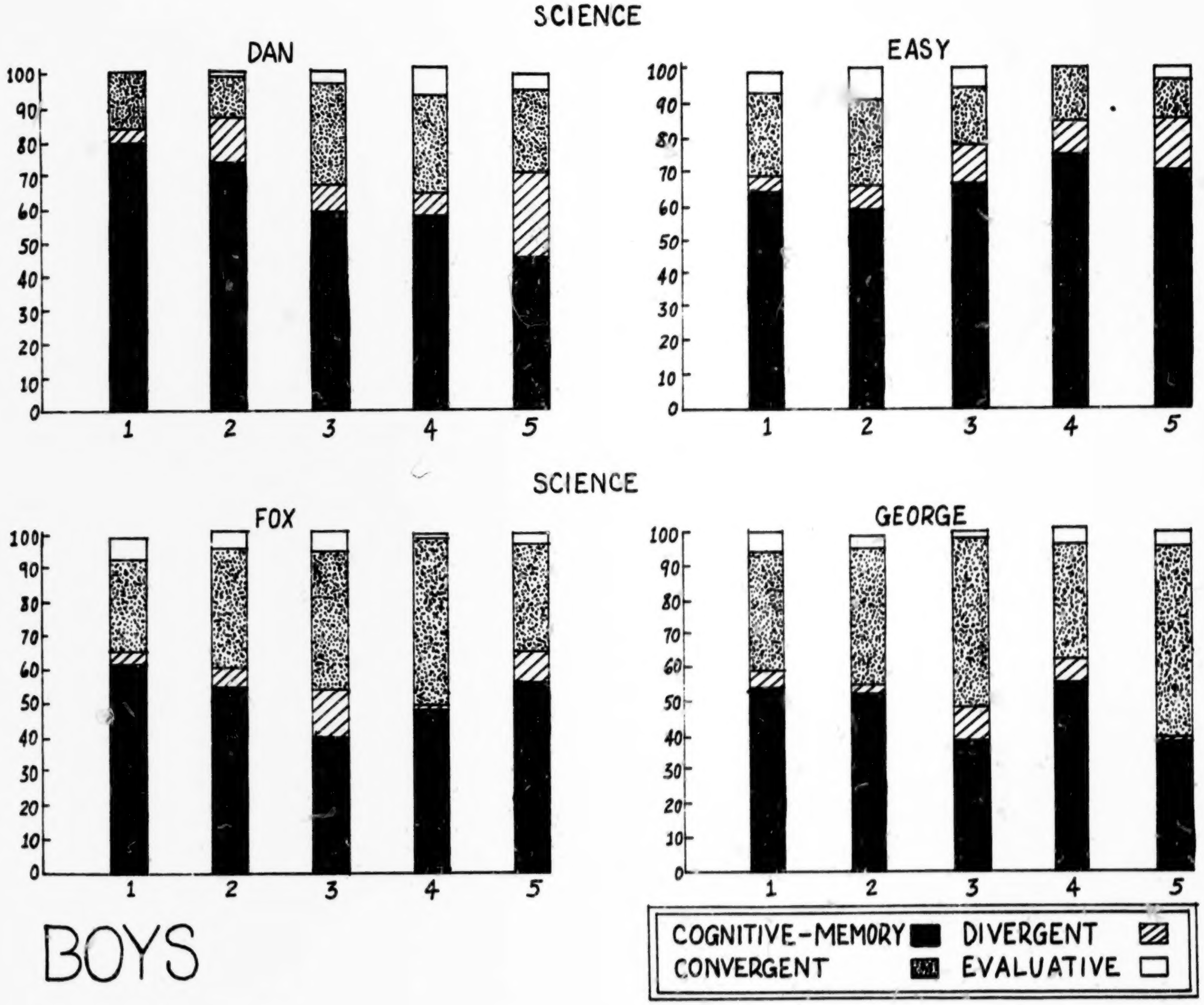


FIGURE 7

PROPORTION OF THOUGHT PROCESSES
GIVEN BY STUDENTS



in Figure 4. There were, a priori, some expectations that Science courses would ask for a different proportion of the thought processes than English or Social Studies classes and these expectations were generally realized.

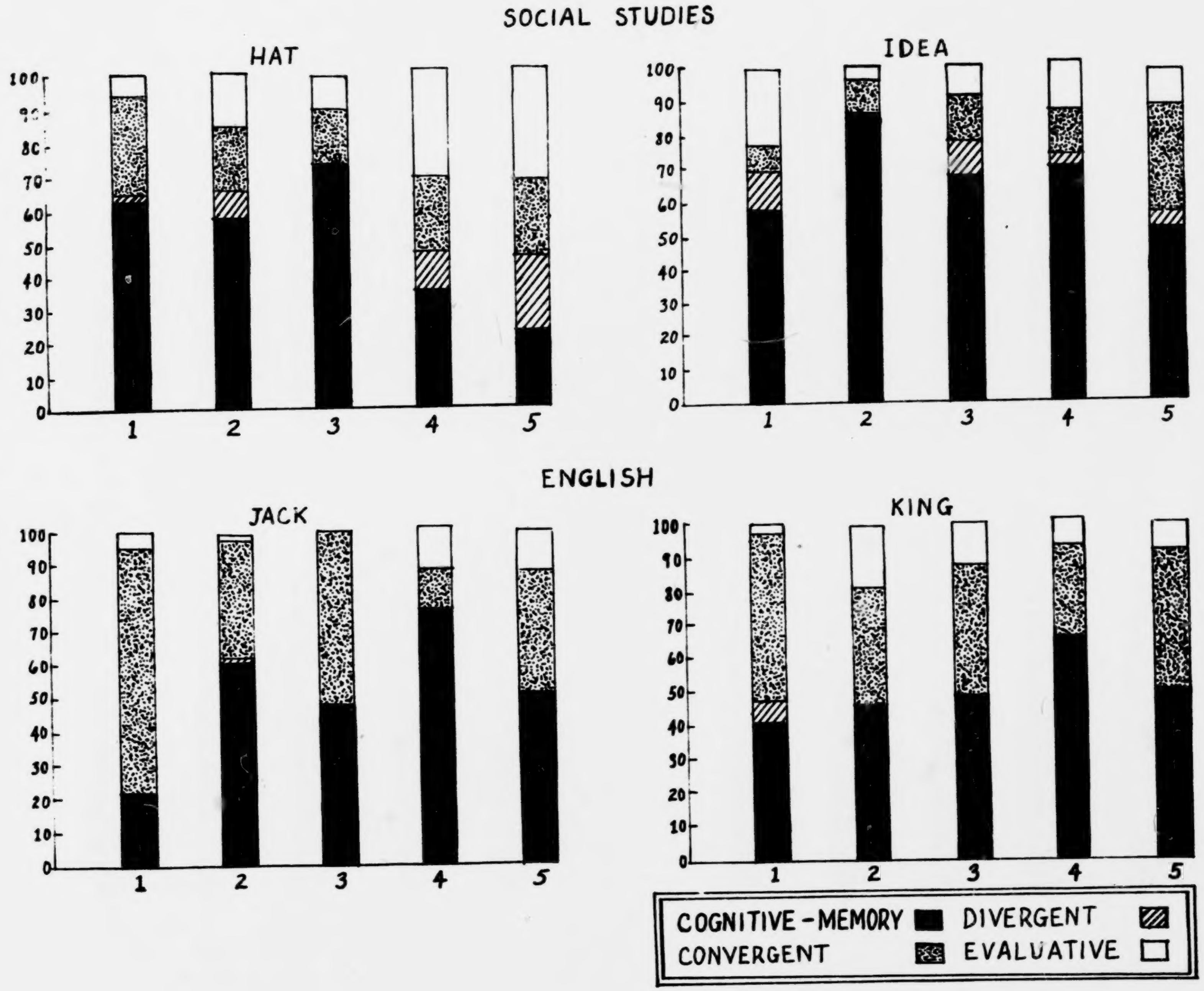
As was previously noted, there were, in various class sessions, instances in which certain kinds of thought operations were completely shut out. There were no questions related to Evaluative or Divergent Thinking in FOX 4 and the same situation prevailed in GEORGE 2 and DAN 3. There were no requests for Divergent Thinking in GEORGE 5, and so it went.

In the FOX and GEORGE series, Divergent and Evaluative Thinking made up less than 10% of the total teacher questions in any one class session. The percentage of requests for these two thought processes was somewhat higher in DAN-EASY but at no point did the combined percentage for these two areas go over 20% of the total. On the other hand, Convergent Thinking often reached 50% or more of the total queries.

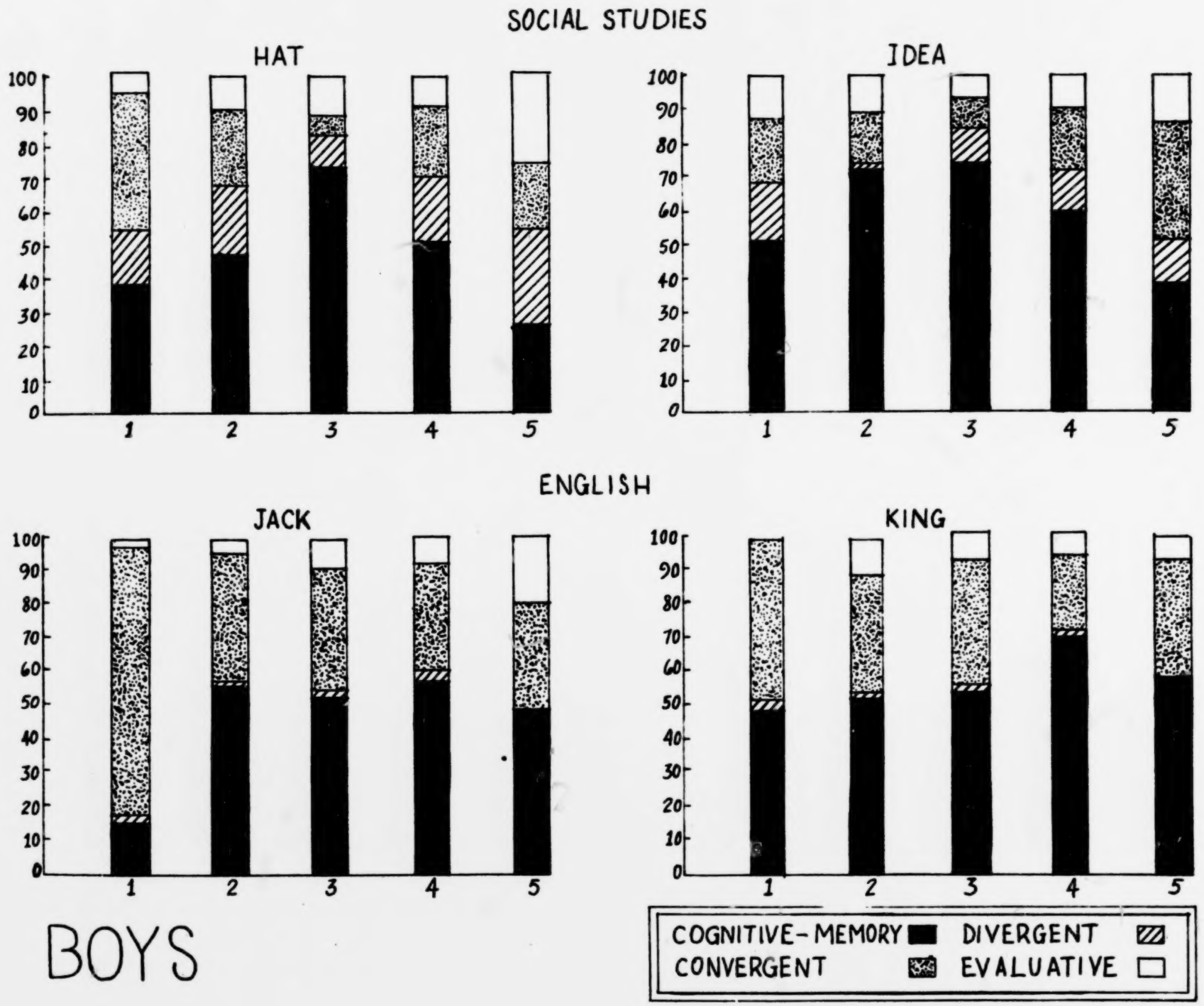
In Figure 7, the student performance in these same two science courses can be observed to follow rather closely the requests for certain thought processes by the teacher noted in Figure 6. Again, it can be observed that a relatively small amount of Divergent Thinking questions on the part of the teacher can bring forth quite a substantial proportion of responses in this area by the students. The rather consistently high level of Convergent Thinking in these classes (compared to the social studies class) seemed to be a reflection of the demands on the part of the teacher for this kind of intellectual operation. Since the teachers in the science sections varied less in their own performance from day to day, the student performance also seemed to vary to a lesser degree. In comparing the styles of the two teachers, the DAN-EASY instructor asked more Cognitive-Memory inquiries while the teacher in the FOX-GEORGE group asked for more Convergent Thinking responses.

FIGURE 8

PROPORTION OF THOUGHT PROCESSES
ASKED FOR BY THE TEACHER



PROPORTION OF THOUGHT PROCESSES GIVEN BY STUDENTS



Figures 8 and 9 present the classroom performance in terms of proportion of thought processes in the final four groups in the study. Figure 8 shows the teacher's question-asking performance in HAT and IDEA; two sections of a social studies class. The bottom of Figure 8 shows teacher performance in the English sections of JACK and KING. It is possible, by perusal of the graphs, to see differences in the teacher styles reflected by the different proportions of thought processes asked for in HAT and IDEA than in the JACK or KING groups. Surprisingly enough, this particular social studies teacher asked for Evaluation to a greater degree than the English teacher, and apparently more than the previous social studies teacher, as shown in Figure 4. These graphs also leave the impression that a teachers' question asking performance depends partly on the structure of the group. There were clear differences between types of questions asked in the HAT and in the IDEA sections despite the fact that the same material was covered on the same days by the teacher in each of these sections. With both of these teachers, considerable variation can be noted from one session to another within the same class section. No one class session could be considered typical of their performance.

In the English sections, JACK and KING, the teachers' questions seem characterized by predominantly Cognitive-Memory and Convergent Thinking. Only in KING 2 did either Evaluative or Divergent Thinking occur in over 15% of the inquiries. Requests for Divergent Thinking were infrequent; such questions did not seem to be a part of this teacher's style.

Figure 9 shows the student statements in these classes. As might be expected, student performance followed rather closely to the pattern requested by the teacher. Since very little Divergent Thinking was encouraged by the English teacher, very little student Divergent Thinking occurred in JACK and KING sections. However, a high proportion of Convergent Thinking may be noted. In response to the greater requests for Evaluative judgment on the part of the students in both the HAT and IDEAS groups, they produced a substantial proportion of Evaluative responses. This is in contrast to the science groups (Figures 6 and 7) that did not seem to utilize Evaluative Thinking to any great extent.

In summary, it can be noted that much of any teacher's response falls inevitably in the Cognitive-Memory area. Convergent Thinking also seems to likely to occur as the next largest proportion of questions asked, if these figures can be considered representative. Whether or not Divergent Thinking appears in student performance depends on the teacher's own philosophy and style of teaching. A very respectable classroom (in terms of cognitive performance) can be operated within Divergent Thinking being requested at all. The same could not be said about Cognitive-Memory or Convergent Thinking responses.

There are some suggestions in these figures that different subject matter areas do seem to pull different proportions of thought processes, although teachers still were able to show their individual style within a given subject matter.

Response Incidence in Secondary Classification

While the preceeding figures give an overall picture of the proportion of the distribution of responses in the major categories, the impressive range of individual differences between teachers, within teachers and between classes is shown in more detail in a breakdown of the incidence of the secondary categories. In this analysis, it is possible to observe the range of performance in the twelve classes.

Teacher Questions. Table 12 indicates teacher questions asked over the five-day series for each of the 12 class groups in the secondary categories. The Routine category is not relevant in analyzing teacher questions since most of Routine responses are statements rather than requests. In the area of Cognitive-Memory the range of responses in terms of requests for Recapitulation or pure memory items, range anywhere from 30 teacher-questions in one class group to 90 in the FOX section. In terms of the amount of facts requested over this period of time, it can again be noted that the variation ranges from 30 in BAKER-Fall to 153 in DAN.

It is tempting to ascribe such differences in performance to the different subject areas. In this regard, it is important to compare the teachers working in the same general subject areas. DAN-EASY and FOX-GEORGE sections are both science, yet many more Convergent Thinking questions were requested in FOX-GEORGE sections than in the DAN-EASY sections. However, many more factual questions were asked in DAN-EASY than in FOX-GEORGE. This is an apparent difference in teacher style influencing the results rather than the pressures of the subject matter. In a similar manner, we can see that the teacher in the social studies sections of HAT-IDEA asked for considerably less facts and Convergent Thinking than the teacher in the social studies sections of BAKER-CHARLIE, although they were covering the same subject matter and almost the same topics at different times.

In the Convergent Thinking area, the range of questions asked between teachers in asking for conclusion type statements was impressive. The range extends from a low of 1 request in CHARLIE-Fall to a high of 43 conclusion requests in GEORGE. In this respect, it is interesting to

TABLE 12

Secondary Category Classifications (Teacher)

Teacher Questions

	ROUTINE					COGNITIVE MEMORY					CONVERGENT THINKING					DIVERGENT THINKING					EVALUATIVE THINKING				
	St	Ver-	Ver+	Du+ mu	Hu	Scr	Re	Clm	Clq	F	Tr	As	Ex	Con	TOTAL	El	Ad	Imp	Syn	TOTAL	U	S	O	TOTAL	ALL TOTAL
Baker-Fall	1	0	0	0	0	0	77	27	7	31	0	22	29	2	53	2	4	8	0	14	4	16	2	22	232
Baker-Spring	2	0	0	0	0	0	49	30	5	48	11	21	23	3	58	2	4	9	0	15	4	14	0	18	225
Charlie-Fall	1	0	1	1	0	0	40	31	4	74	0	18	23	1	42	0	9	11	0	20	3	7	0	10	224
Charlie-Spring	0	0	0	0	0	4	72	48	6	79	4	14	25	2	45	2	7	5	0	14		7	0	7	275
Dan	1	0	0	0	0	0	64	17	10	153	8	29	31	7	75	0	14	6	0	20	3	6	0	9	349
Easy	3	0	0	0	0	1	46	7	0	141	4	28	32	7	71	0	13	4	0	17	5	11	0	16	302
Fox	2	0	0	0	0	0	90	30	6	50	10	52	92	41	195	0	3	2	0	5		11	0	11	389
George	2	0	0	0	0	2	58	34	3	78	18	17	84	43	162	0	4	6	0	10	2	7	0	9	358
Hat	3	0	0	0	0	6	30	25	5	41	1	18	14	9	42	1	8	4	0	13	8	21	0	29	194
Idea	3	0	0	0	0	2	30	41	13	36	2	14	10	4	30	3	5	3	0	11	13	9	0	22	188
Jack	3	0	0	0	0	1	59	16	3	43	0	37	14	28	79	0	0	1	0	1	6	13	0	19	224
King	1	0	0	0	0	0	46	16	4	51	0	41	18	25	84	0	2	0	0	2	9	16	0	25	231

Teacher Statements

	ROUTINE					COGNITIVE MEMORY					CONVERGENT THINKING					DIVERGENT THINKING					EVALUATIVE THINKING				
	St	Ver-	Ver+	Du+ mu	Hu	Scr	Re	Clm	Clq	F	Tr	As	Ex	Con	TOTAL	El	Ad	Imp	Syn	TOTAL	U	S	O	TOTAL	ALL TOTAL
Baker-Fall	126	23	41	7	6	5	107	98	33	27	6	20	25	49	100	16	9	6	0	31	58	12	7	77	681
Baker-Spring	183	36	55	10	13	8	176	132	55	78	19	30	33	61	143	13	12	4	0	29	71	17	5	93	992
Charlie-Fall	154	63	57	11	12	4	119	112	65	54	2	28	34	51	115	8	14	11	0	33	55	12	3	70	871
Charlie-Spring	224	24	63	23	18	11	174	120	76	50	15	24	36	63	138	6	26	9	0	41	69	25	10	104	1066
Dan	177	11	22	11	1	17	280	76	78	121	12	34	83	59	188	4	12	3	0	19	123	19	2	144	1145
Easy	167	6	6	18	4	14	263	113	55	168	18	60	93	60	231	8	20	7	0	35	98	30	2	130	1210
Fox	184	35	0	15	25	6	290	68	39	57	24	13	32	14	83	4	8	3	0	15	28	10	2	40	857
George	268	27	3	12	38	2	208	45	22	83	36	12	19	17	84	1	8	1	0	10	26	7	0	33	835
Hat	139	12	14	3	3	4	88	59	10	16	8	15	9	35	67	2	9	4	1	16	24	6	0	30	461
Idea	188	18	36	1	9	1	65	45	9	9	3	18	7	33	61	4	11	5	0	20	48	3	0	51	513
Jack	236	10	14	1	20	1	136	120	65	53	0	37	58	66	161	6	9	0	0	15	109	10	3	122	954
King	276	24	12	5	18	1	232	161	79	48	1	61	64	77	203	10	7	4	0	21	96	20	2	118	1198

compare the number of conclusion type statements by the teacher in Table 12 compared to the number of conclusions asked for by the teachers. In most of the class sections, it can be seen that teacher conclusion statements outweighed teacher conclusion questions by a ratio of 3:1 to 10:1. Only one teacher requested more conclusions from the students than he gave himself.

It is necessary to point out that the goal of this project was not to strive to approximate some theoretical ideal of teaching style, but rather to point out in a descriptive fashion what seemed to be happening. If, for example, the teacher has a commitment to the discovery method, in which the teachers are presumed to encourage the students to reach conclusions on their own, then a ratio of 5:1 or 6:1 of teacher conclusion statements to teacher conclusion questions would be viewed with some alarm. If, on the other hand, the goal of the teacher was to present concisely and clearly the most important point involved in the discussion, then such a ratio might not be looked on with disfavor.

The Translation column in Convergent Thinking has mainly to do with map reading in the social studies sections. In the science sections, it involved moving from the symbolic language of mathematics to the semantic area. The request for Explanation, which represented the logical reasoning required to justify positions or conclusions, varied from 10 in IDEA group to 92 in FOX.

In terms of teacher questions on Divergent Thinking and Evaluative Thinking, one can see again the lesser incidence in these two areas in comparison to Cognitive-Memory and Convergent Thinking as previously noted on the graphs. In the area of Elaboration, which has to do with the building of a point already made or in the generation of an instance or an example, it was surprising that so few teacher questions were asked. The area of divergent implications, which stresses extrapolation beyond the given or projection of an idea from given data, received only slightly more attention. The range in this area is from 0 requests in KING to 11 in CHARLIE-Fall. As was true with other divergent questions, one teacher question, asking for implications, can bring forth a volume of responses from the students far out of proportion to the ratio presented in teacher questions.

Teacher Statements. In Table 12, the teacher statements are categorized. These statements reflect the intellectual and management expression of the teacher and is generally not designed to elicit students comments. While the type of question asked for indicates the goals of the teacher's lesson, the statements would seem to reveal more of the teacher's personal style.

Under the Routine category in Table 12, there was a wide range of difference between teachers in the expression of negative and positive verdicts. Verdicts represented teacher approval or disapproval of student behavior or performance. In this instance, we were interested in the ratio of positive to negative verdicts, as well as the absolute number of verdict statements made by the teacher. The most favorable positive to negative ratio was found in CHARLIE-Spring where the teacher gave 63 positive verdicts as opposed to 24 negative verdicts over the five tape recorded sessions. At the other extreme, was the FOX section in which the teacher gave no positive verdicts over the five sessions but expressed 35 negative verdicts. The nature of the group also influenced this verdict ratio as can be seen in looking at the difference between sections that had the same teacher. For example, in DAN the positive to negative verdict ratio was about 2:1, whereas in EASY, the afternoon section with the same teacher, the ratio was 1:1 with much fewer expressed verdicts of either kind. The verdict ratio was fairly even in the HAT session but in the IDEA session, there was a 2:1 positive to negative verdict margin. Similar differences between sections with the same teacher were found in the JACK-KING group.

It is of interest to compare the same positive to negative verdict ratio in the boys statements. (The girls, as seen in Table 13, do not often give many verdicts of either sort.) The ratio of the boys' positive to negative verdict seemed to be highly related to the ratio of the teacher verdicts as noted by a Spearman-Rho correlation of .82 on the verdict ratio of teacher to verdict ratio of boys in twelve classrooms. No simple causal relationship need be inferred here. It would be more likely that some complex affective balance was established between teacher and students in each classroom.

In terms of the category "Humor," there was a range extending from one such teacher statement in the DAN section to 38 in the GEORGE section. Like most of the other figures, these simple numbers tend to obscure more complex behavior. The humor, as expressed can be either directly related to the classroom material,or it can be an 'off beat' topic--such as a humorous story which appears to derail the classroom discussion more than further it.

As one example of another type of humor, the casual introductory statement by the teacher, "Now that we no longer have daylight savings time, it was easy to get up this morning." would be classified as Humor as would be the accompanying student response, "It was?". As an introductory statement, this type of humor seemed to create a more relaxed atmosphere without interfering in the academic operation of the classroom.

Another type of humor which suggested that something may not be all that it should be in the teacher-student relationship was recalled by a statement as this,

T: "I will now hook up the apparatus and we'll see what happens."

John: "If you're in your usual form, nothing will happen."

This type of interchange, particularly if these sentiments are supported by other students in the class, carry a bite to them quite different from the casual quip or play on words that occurred in most classes of gifted children. Further examination of humor in the classroom will be carried on as an extension of the present study.

In terms of fact dispensing, as shown in Table 12, the range of teacher statements extended from a low of nine factual statements in the IDEA section to a high of 168 in the EASY section. This marked difference would seem to reflect the type of information-dispensing in a class as characterized by the DAN-EASY sections in comparison with a class that spent less time on specific facts and struggled with the more abstract concept of colonization as was true of HAT-IDEA.

The variation between teachers in Convergent Thinking extends over each of the sub-categories. Translation activities represent the movement from one medium to another, such as from the symbolism of mathematics to semantic language or from observation of events to language. This appears to be more frequent in the Science classes than in English and Social Studies. Explanation represents the closely organized logical presentation of ideas and, in terms of frequency, most often occurs in Science and least often in the Social Studies sections.

There was a greater consistency between sections taught by the same teacher in the teacher statements than in teacher questions supporting the notion that there is a personal teaching style involved here.

In Divergent Thinking, the Social Studies teachers did not appear strikingly different from the Science or English teachers. The English teacher gave a representive number of Divergent Thinking responses although she did not ask for much Divergent Thinking from her classes. Elaboration, or the development of instances of examples appeared more in the Social Studies and English sections, as might be expected. The drawing of implications, or extension of ideas, was not clearly an exclusive property of a subject area.

In terms of Evaluative Thinking, it was something of a surprise to see that one of the Science teachers showed greater expression than either of the Social Studies teachers, or the teacher of the English sections. This appeared to be accounted for on the basis of personal style in which, for example, the teacher would say, 'So bacteria can be parasites right on human beings. It is not very pleasant to think about but actually this can be true.' This type of statement represents a personal evaluation not necessarily essential to the content material. All in all, the incidence of teacher statements in the secondary categories were probably a better reflection of the wide range of individual differences between teachers, and within a given teacher's performance from one time to another, than were the broad general primary categories as recorded in the preceding graphs.

Student Statements. Table 13 indicates the total performance on the secondary categories of the boys and the girls over the five class sessions in twelve class sections. Comparing the total Verdicts, one can see that,

TABLE 13

Secondary Category Classifications (Student)

Boys Statements

	ROUTINE					COGNITIVE MEMORY					CONVERGENT THINKING					DIVERGENT THINKING					EVALUATIVE THINKING				
	St	Ver-	Ver+	Du+ mu	Hu	Scr	Re	Clm	Clq	F	Tr	As	Ex	Con	TOTAL	El	Ad	Imp	Syn	TOTAL	U	S	O	TOTAL	ALL TOTAL
Baker-Fall	20	4	0	19	4	3	73	15	14	46	3	16	59	10	88	4	29	58	0	91	19	26	8	53	430
Baker-Spring	25	2	3	11	11	0	78	28	33	57	7	34	75	11	127	11	28	21	1	61	26	30	13	69	505
Charlie-Fall	39	5	2	15	19	0	65	33	34	98	1	15	51	6	73	5	27	67	0	99	6	11	5	22	509
Charlie-Spring	62	4	2	10	48	10	122	56	66	144	21	20	56	24	121	12	62	39	1	114	23	21	13	57	816
Dan	8	0	0	13	0	1	39	14	10	112	4	29	28	7	68	0	21	9	0	30	3	7	0	10	305
Easy	0	8	3	6	9	2	53	25	17	146	2	26	30	8	68	1	26	8	0	35	3	15	0	18	390
Fox	60	14	0	29	42	3	180	56	106	135	29	85	151	58	323	3	39	23	0	65	15	22	11	48	1061
George	91	41	10	24	55	2	112	67	109	111	51	35	163	91	349	[illegible]	27	9	0	36	16	11	4	31	1044
Hat	42	7	2	10	14	2	41	29	71	42	3	22	46	22	93	16	30	31	1	78	14	26	6	46	477
Idea	57	0	1	12	5	2	40	30	47	96	2	25	33	16	76	7	18	18	2	45	21	18	3	42	453
Jack	16	5	0	3	5	0	48	28	34	27	0	57	32	29	118	1	4	0	0	5	7	16	3	26	315
King	34	37	2	5	21	0	82	51	56	55	1	52	38	43	134	0	4	3	0	7	14	16	1	31	515

Girls Statements

	ROUTINE					COGNITIVE MEMORY					CONVERGENT THINKING					DIVERGENT THINKING					EVALUATIVE THINKING				
	St	Ver-	Ver+	Du+ mu	Hu	Scr	Re	Clm	Clq	F	Tr	As	Ex	Con	TOTAL	El	Ad	Imp	Syn	TOTAL	U	S	O	TOTAL	ALL TOTAL
Baker-Fall	10	1	0	3	3	0	48	8	4	29	1	16	27	3	48	3	13	20	1	37	16	7	5	28	219
Baker-Spring	2	0	0	0	0	1	1	0	0	3	5	12	21	7	45	5	11	10	1	27	12	12	1	25	184
Charlie-Fall	28	1	2	7	3	0	40	10	14	41	3	16	31	2	52	1	18	52	0	71	16	11	6	33	302
Charlie-Spring	33	1	1	9	2	4	73	13	15	0	4	16	23	13	56	7	14	17	2	41	3	7	1	11	319
Dan	5	0	0	4	0	0	47	7	7	87	2	10	5	2	19	0	9	3	0	12	3	4	0	7	195
Easy	3	0	0	5	0	0	23	6	6	74	5	17	14	2	38	0	6	0	0	6	4	2	1	7	168
Fox	41	8	1	24	31	0	124	46	71	95	10	44	76	35	165	0	12	7	0	19	9	12	6	27	641
George	55	23	5	30	36	0	93	54	93	126	7	40	60	47	154	0	6	3	0	9	5	2	0	7	685
Hat	31	0	0	8	2	6	41	22	17	58	2	11	17	11	41	3	14	7	0	24	15	9	5	29	261
Idea	53	1	0	12	0	6	31	23	24	60	0	12	27	14	53	8	9	7	0	24	24	15	5	44	331
Jack	8	0	0	5	0	1	39	18	15	29	0	32	19	29	80	0	0	1	0	1	3	1	3	7	203
King	14	14	0	4	11	0	40	15	31	31	0	30	32	28	90	0	1	2	0	3	9	13	0	22	275

in almost all of the sections covered, the boys outproduced the girls in total verdicts rendered. The boys rendered 127 negative verdicts as opposed to 25 positive verdicts. The girls, in contrast, rendered only 49 negative verdicts and 9 positive verdicts. The verdict ratio remained practically the same for both sexes, i.e., 5:1 negative to positive ratio, in contrast to the teachers who generally balanced out the positive and negative statements. Evidently it was easier for students to give a negative than positive verdict in the classroom setting. In terms of humorous statements, the boys gave a total of 233 while the girls gave a total of 96 over the same period of time despite almost equal representation in the class. Similar differences occur in each of the content categories in favor of the boys at a ratio of about 2:1.

Among the results for both boys and girls on Cognitive-Memory, the ratio between Clm and Clq was almost even in all classes. But in the teacher statements shown in Table 12, the ratio was in favor of Clm at least 2:1 and sometimes much greater. Since Clq is a correcting response or an addition to the original statement, it appears that the students engaged more in such behavior than in reformulating or clarifying ideas (Clm). When this result is taken along with the high number of negative verdict responses, this suggested that these gifted students were spending a considerable time in class disagreeing with, or amending, their fellow students' and teacher's statements. The comments of observers would suggest that some gifted students take this relatively easy way out of making minor corrections or amendments as their contribution to class discussion rather than generating ideas or concepts of their own that require more preparation and prior cognitive work.

Convergent Thinking responses of the boys and the girls followed expected trends. The ratio of production was 2:1 in favor of the boys--rather typical of the overall results. In a category such as Conclusions, the number of student statements expressed was closely related to the number requested by the teacher. The different style of the two science teachers can be noted in the performance of the students. In the FOX-GEORGE groups there were about five times as many responses as in DAN-EASY. Table 12 on teacher statements and questions showed the DAN-EASY teacher making more statements but phrasing fewer questions in this thought dimension. This was but another indicator of how closely student response was tied to teacher behavior. In the general area of Divergent Thinking, the total performance of the boys seemed to outweigh the girls in all sections except JACK-KING, in which the disinclination of the teacher to encourage this type of cognitive behavior apparently limited the performance of both groups. Most of these same students were also members of the FOX-GEORGE groups and had participated in Divergent Thinking operations in these sections.

The category of Synthesis which was supposed to represent an original (for the student) integration of material was not often found. It would appear that such high level abstracting behavior in oral discussion may be an unrealistic goal. Gifted students could well perform such intellectual feats in their written work where time, prior planning and class discussion would lay the ground work for such activities.

The different results of implication-type questions are shown with a range of boys' responses extending all the way from 0 implication statements in JACK to 67 in CHARLIE-Fall. Girls showed a similar, if more restrained, response. Thus, relatively few requests in this area can generate a large proportion of reactions on the part of the students.

The results on Evaluative Thinking showed a rather equal division of responses in Unstructured Ratings and Structured Probability statements. Less comments were made on Qualification, which was a disagreement with a prior rating by the teacher or another student. Some zero scores were obtained in this category since one can't quarrel with a rating or judgment that hasn't been expressed. In DAN-EASY sections, for example, very few ratings were made and thus few counter judgments expressed. In Evaluative Thinking there seem to be more differences between sections than occurred in the other categories. Generally, this seemed to be brought about by one student making a judgmental response and the rest of the students chiming in with judgments of their own on the topic under discussion.

In summary, while the performance of the students did seem highly related to teacher performance over all cognitive areas, there remained impressive differences between sections with the same teacher. This suggested that perhaps more complex factors, involving the composition of the group, and perhaps even the accident of the particular topic of discussion, influenced the proportion of statements made in each of the categories.

In view of the obvious variations between teachers, all of whom have been rated as effective teachers by their supervisors, it would seem wise that some empirical sampling of just what is meant by 'teacher effectiveness' should be a desirable first step. For example, in studies where one particular style, such as the teaching of phonics or the discovery method is concerned, it would probably be necessary to analyze in some depth the actual performance of the individual teachers rather than to assume that their classroom behavior would be similar merely because they had the same philosophy of teaching or the same background of training as another teacher.

What were the Relationships Between In-Class and Out-of-Class Factors?

Tables 14 and 15 show the results of the principal axis component analyses (varimax rotation) which were computed to explore the essential relationships between the classroom performance variables and a variety of other tests and rating variables which did not bear directly upon classroom performance. Boys' and girls' data were analyzed separately. The terms factor and component are used interchangeably in this report. Although technically the project results involve components, it is much easier to communicate the essential results by referring to them as factors, and the differences are minute for reporting purposes.

Group A Results. Table 14 indicates the factor loadings obtained from group A. This group composed of BAKER-CHARLIE and HAT-IDEA was students. The BAKER-CHARLIE group was recorded twice, once in the fall and once in the spring. The spring classroom data was chosen for this analysis on the basis of greater stability of performance observed during that segment.

In Tables 14 and 15, factor loadings of .30 or greater were included; those between .25 and .30 were marked as traces by T. An asterisk shows the next highest loading of a variable that has only one loading reported. For example, in group A Boys, Conclusions loads .91 on the first factor; had the next highest loading for Conclusions was on factor 7 and is noted by an asterisk.

Table 14

Group A Principal Axis Factor Loadings by Sex (Varimax Rotation)

	BOYS							GIRLS							
Variables	1	2	3	4	5	6	7	1	2	3	4	5	6	7	8
Classroom Performance															
Cognitive-Memory	84					T		83						-37	
Divergent	78				T			91						-*	
Convergent	92		-*					89						*	
Evaluative	89					-*		78					35		
Conclusion	91						*	90							-*
Explanation	88		-T					86				*			
Associative	88	-*						88							*
Qualitative	79					T		87				-T			
Test Data															
Verbal IQ	*			83						87				-*	
Non-Verbal IQ				70	33					83		-*			
Uses Breadth			76			31		38					74		30
Consequences Breadth			78			-*				-T			77		-T
Consequences S/T			-*		89			-*							85
Semantic Differential															
Mothers		77				45			72			43			
Fathers		83		*					83	T					
Student	-*	81						-31	60		39				
Work		75		-T					74	-T		T			
Competition		83					-*		43	*		59			
Success		42				72			T			83			
Love		42		39	-51				79	-T					
Faith		*					-86	T	50	31	40				
Imagination		36	45				41		30					86	
School		60				32			48	-55		T		-32	
Teacher Rating															
Cognition	+49			+55	-33			-T			-76				
Sociability			+59				-33				-85				-*
Percent of Variance	34	22	11	10	8	7	7	32	18	11	9	9	8	7	6

* Second highest loading

T = .250 to .294

The first factor that was extracted for both boys and girls was clearly that of classroom performance with a contribution of 30% of the total variance in both instances. The classroom data stands alone with a few exceptions, and does not seem to be related significantly to either personality, attitudinal,or paper and pencil measures of cognitive abilities. However, in boys, Factor I, there was evidence of a positive relationship between teacher ratings of intellectual ability and the classroom performance variables. The same relationship was found to a lesser degree in the girls, Factor I. It could easily be argued that expressiveness in the classroom was the main basis for teacher judgment in this area and that the rating of the teacher was merely a confirmation of such expressiveness.

The remarkably high loadings of all the classroom performance variables on the general expressive factor came as something of a surprise to the investigators. It had been supposed, prior to data collection, that there might be two or more factors extracted from the classroom performance data,with students revealing different cognitive styles of divergent or evaluative performance. In addition, other expectations were held that these different cognitive styles would be related to other attitudinal and cognitive measures.

The general factor of expressiveness, however, can be easily explained by the variety of different demands made in the classroom environment on the different cognitive abilities of the students. Suppose the divergent question, 'What might have happened if the Spanish Armada had won over the British.' is considered. Any answer given to this question, while it is a response to a divergent question, must necessarily involve Convergent Thinking and Cognitive-Memory skills as well. Evaluative Thinking is almost always used in answering such a question in the sense of considering various possible answers and then eliminating those not deemed appropriate. In other words, a student who wishes to express himself as a productive thinker in classroom interchange is forced to use all of the major categories of thinking operations. Once this central fact is recognized it is not unreasonable to expect reasonably high intercorrelations between the classroom variables.

The second largest factor for both boys and girls in Group A can be labeled sanguinity, or a general undifferentiated positive or negative attitude towards other people and other things. This factor accounts for 22% of variance for the boys and 18% of the total variance for the girls. In this sample, this general emotional tone--positive or negative--does not seem to relate closely to either classroom performance or other cognitive measures, but gains its identification through loadings on the semantic differential scales. The boys seemed to make little differentiation between the various semantic differential concepts while the girls placed some semantic differential concepts on other factors.

On the boys, higher loadings were obtained on concepts of Student, Competition and Success while for the girls, a higher loading was obtained for Love and Faith. One tentative suggestion therefore, would be that, for the boys, a positive feeling about the world stresses achievement, whereas for the girls, it represents more attitudes towards socio-emotional relationships.

The third factor for the boys and the sixth factor for girls can be labeled divergent test production although they were not identical for the two sexes. Both the Uses and Consequences breadth scores loaded highly on the factor. An interesting sex difference lies in the high loading of teacher ratings on Sociability for the boys on this factor, but not for the girls. Apparently those boys considered popular by the teacher were the same boys that scored highest on divergent tests. This result does not fit well with prior information that tended to relate trends towards divergence with asocial interests. The tend to a negative loading on classroom explanation can be explained by noting that the divergent thinking style, marked by a variety of responses, has been considered antagonistic to closely reasoned statements which would follow a single response to its logical conclusion.

For the girls, the divergent tests seem related slightly to evaluation responses in the classroom but not to the Explanation category, or to teacher ratings on Sociability. This represents the first of a number of sex differences to be recorded in these samples. There is no obvious rationale for tying together the two related areas in the girls' performance.

Factor four for the boys (10% of variance) and factor three for the girls (11% of variance) represented a cognitive ability factor with heavy weighting for verbal and nonverbal IQ for both boys and girls. Once again, although the general factor label can be the same, there were interesting differences in these factors for the different sexes. There was a heavy weighting of teacher ratings of cognitive abilities for boys, which was not present for girls. The teachers preceived the high IQ boys as performing in cognitive abilities so that tests indicated teacher attitude to cognitive in boys but not the girls. In addition, the boys had a small positive weighing for the Semantic Differential concept Love and a negative trace loading on Work. Although IQ scores were not related to classroom expressiveness in boys, the teacher ratings on cognitive abilities were associated with both verbal and nonverbal IQ.

For the girls, there was a strong negative attitude to School accompanying the high IQ factor and a negative loading for Work and Love, but a positive trace for Fathers. This seemed suggestive of some dissatisfaction of the high IQ girls in their school learning environment which would fit the general confusion of role expectations for gifted girls. This problem was not shared with gifted boys who felt no social barriers to aggressive expression in the intellectual realm.

Factor five for the boys (8% of variance) and factor eight for the girls (6% of variance) was loaded mainly on the Solutions scores on the Consequences test. On this test, the student, instead of listing problems to a question such as, 'What would happen if anyone were born with three fingers and no thumb?' would concentrate on ways to handle the problem by the construction of solutions. It was considered, a priori, that this style of response represented considerable cognitive integration and maturity. Associated with this factor in the boys is a negative loading on the concept of Love, a negative rating by teacher on cognitive ability and a positive loading on non-verbal IQ. The precise meaning of this odd combination remains obscure and not too much importance need be placed on it since the pattern of these findings is reversed in Group B.

With the girls, the Solutions score on the Consequences test was related, in a weak fashion, positively to Uses breadth score, negatively to Consequences breadth, with a positive trace on the concept of Competition. The negative relationship of the two Consequences scores probably indicates that extended time must be taken to give Solutions. The student must go through two steps to reach a solution--first to think of a problem, then a solution to the problem--and that requires time and reduces total responses on a timed test. For example, in answer to the question, 'What would happen if everyone were born with three fingers and no thumb?' The student might say, 'Cars would need a rudder instead of a steering wheel.' He first would have to think of the problem of driving a conventional car under the circumstances.

Factor six for the boys (7% of the variance) and factor five for the girls (9% of variance) had the heaviest loading on the Semantic Differential concept of Success. For the boys, a positive attitude towards Success was related to positive attitudes on concepts of School and Mother with positive trace loadings on Cognitive-Memory and Qualitative classroom expressiveness. Such a factor seemed to represent a traditional success striving type of pattern--the student who wishes to be good and who holds traditional values.

With the girls, Success is also related to Mother as well as to Competition, with a negative trace on Qualitative expressions in the classroom. These success-related factors in girls refer to traditional values. The negative trace loading on classroom Qualitative performance fits into a 'Be a good girl and don't take chances or ask questions or argue' approach.

The three remaining factors seemed to be sex specific. Factor seven (7% of variance) for the boys was loaded on the Semantic Differential concept of Faith. Positively related to this concept were the teacher ratings on Sociability but there was a negative loading on the concept of Imagination. That there would be perceived negative relations between concepts of Faith and Imagination is rather interesting. Can one not have a high regard for imagination and faith also?! These boys seemed not to think so.

The two factors specific to the girls were four and seven. Factor four (9% of variance) represented most fully the teacher ratings of the girls on both cognitive and sociability dimensions. It will be recalled that the teacher ratings of the boys on these dimensions were divided into different factors. Negatively related to these teachers ratings were the student's view on concepts of Faith and Student. One interpretation of this complex was that the less secure students in teacher acceptance will tend to rate traditional values more highly. The girls most in favor with these teachers may feel it possible to have greater freedom of expression and not have to support traditional concepts so enthusiastically.

Factor seven (7% of variance) for the girls loads highest on the Semantic Differential concept of Imagination with a small positive relationship on the concept of Work, with negative loadings on School and Cognitive-Memory classroom expression. The concept of Imagination seems to possess multiple meanings to these students. Sometimes it appears to be seen as a necessary accompaniment to good school work; other times, as a cognitive luxury unrelated to academic duties.

It must be remembered that only the first two factors accounted for as much as fifteen percent of the variance and too much should not be made of the smaller factors unless supported by other data.

The most impressive aspects of the Group A factor analysis were the degree to which all of the classroom data fell into one factor and did not seem to relate to other characteristics of the students. The sex differences in loadings on these factors were also suggestive of different attitudinal patterns underlying apparently similar behavior. The multiple regression analysis will underline further these sex differences.

Group B Results. Table 15 shows the principle axis factor loadings (varimax rotation) that were obtained on Group B. These results have been drawn from the sample of students in the DAN-EASY, FOX-GEORGE and JACK-KING groups instructed by two Science teachers and one English teacher. The major difference between Group A and B in terms of the variables used was a substitution of the Sentence Completion data for the Semantic Differential scales.

The component analysis of the data from Group B appeared, in many ways, structurally similar to that of Group A. For both boys and girls, there was a major first factor accounting for about 40% of the total variance which could be labeled 'classroom expressiveness.' For the boys, there was only a hint of an additional positive loading with one of the divergent tests. The relatively high loading on Teachers' Ratings on Cognition that was found in the factor of classroom expressiveness in Group A was not noticed here. Instead, there was a small positive loading on Teachers' Rating on Cognition for the girls on this factor! However, the two basic findings of Group A were confirmed. There was only one classroom expressiveness factor extracted from all the classroom data and the other variables included in this analysis were not highly loaded on this factor.

Factor 2 for the boys (13% of variance) and Factor 3 for the girls (11% of variance) was loaded heavily on the divergent thinking tests but were otherwise different in structure. As with the Group A boys, there was an interesting positive loading for Teacher Rating of Sociability with the divergent test scores for Group B boys suggesting that their ability to get along with the peer group was related positively to high scores on tests of divergent production. The students' ratings of Other People

Table 15

Group B Principal Axis Factor Loadings By Sex (Varimax Rotation)

Variables	1	2	3	4	5	6	1	2	3	4	5	6	7
Classroom Performance													
Cognitive-Memory	92		*				95				*		
Divergent	87			-*			77				-*		
Convergent	94			*			86			-*			
Evaluative	91		*				76		T				
Conclusion	88				-*		91					-*	
Explanation	93			*			84				*		
Associative	90		*				88			-*			
Qualitiative	94				*		88			*			
Test Data													
Verbal IQ				T	70		*				85		
Non-Verbal IQ				-*	84				-56		36	-36	44
Uses Flexibility	T	-58	32	*	41				51	-63			
Consequences Flexibility		-67	T						86		*		
Consequences S/T				75		T						*	91
Sentence Completion													
Self		*	-77					T		67	*	-35	36
Fears					-*	-90		-*		-79			
Time			78			T	*	86					
Work Styles		61	48			-T		54			-52		
Family				79		T		82			*		
Other People		55		T	T	30		86	*				
Teacher Rating													
Intellectual				+39		-54	+34		+49		+38	-45	
Sociability		-68	*				*					-90	
Percent of Variance	44	13	11	11	10	10	38	16	11	10	9	9	8

* Second Highest Loading
T = .250 to .294

and work style attitudes to such concepts as Imagination and Creativity were negatively labeled. The negative relationship between divergent test production and attitudes to creativity suggested that the relationship between 'divergence' and 'creativity' needs to be examined carefully. On the other hand, factor 3 for the girls showed a negative loading on nonverbal IQ and positive loading on Teachers' Ratings on Cognition for the factor that includes performance on the divergent tests. This factor for Group B girls was different from that obtained for Group B boys and also different from that obtained with the Group A girls.

The rest of the factors appeared to be sex specific and will be reported as such. The remaining four factors for the boys each accounted for about 10 per cent each of the total variance.

Factor 3 for the boys appeared to represent a positive self-image combined with a moderate relation to divergent test production. Associated with these positive feelings were a negative orientation to past and future experiences and such concepts as imagination, creativity, competition, etc.

Factor 4 for the boys represents a pattern of cognitive-emotional stability. The high loading on attitudes to Family and on the Solutions scores on the Consequences Test together with a positive weight on the Teachers' Ratings of Cognitive Ability was suggestive of an adjustment pattern marked by personal stability combined with cognitive efficiency. Such a positive pattern might not include the kind of intellectual risk taking required for the 'divergent thinker.'

Factor 5 for the boys can be characterized as the IQ factor, including weights for both verbal and nonverbal IQ scores. Included in this factor for the boys was a weak loading on Uses Flexibility score and a trace loading on views of Other People. This again differed from the pattern obtained on factor 4 for the Group A boys in that there was no positive loading on Teachers' Rating on Cognition to accompany the IQ results.

Factor 6 for the boys had its predominant loading on Fears, as expressed on the Sentence Completion Test. Accompanying this was the fairly high loading for Teachers' Rating on Cognition. The students with the least fears obtained the higher teacher ratings on cognitive ability as might be expected. The lower rating of Other People and Family also fits into the negative adjustment pattern here.

For the girls' the second factor (16% of variance) showed its predominant loadings on a number of the sentence completion variables. It appeared to be closely akin to the general Sanquinity factor or feeling of 'joie de vivre' noted in Group A girls. Neither classroom performance, cognition scores nor teacher ratings were closely associated with this factor. A similar separation was true on the Group A girls and suggested the conclusion that such generalization of affect does not relate specifically to cognitive performance.

Factor 4 (10% of variance) for the girls loaded heavily on self-concept and the absence of fears. This general self-confidence syndrome was related negatively to scores on the Uses Breadth test. Beyond suggesting that self-confidence or self-satisfaction may lower the motivation for performance on divergent tests, no explanation for this collection of variables can be found, nor was this combination repeated in any of the other groups.

Factor five (9% of variance) for the girls primarily loaded on verbal IQ scores with only a secondary loading on non-verbal IQ. The nonverbal

IQ scores for the girls loaded on three other factors as well. Teachers' Rating on Cognition was included in this factor, a finding that was also obtained with Group A boys (See Factor 4, Table 14). Also, present was a negative weighting on attitude to Work Style concepts of Creativity and Imagination. Highly positive views on such concepts as Imagination and Creativity thus did not accompany high verbal IQ scores. There was some indication that these concepts were related in student's minds to the expressive arts and not to the more semantic areas.

Factor 6 (9% of variance) for the Group B girls loaded heavily on the Teachers' Rating on Sociability with a secondary loading on Teachers' Rating on Cognition also included. These two ratings were found together in the same factor for Group A girls also. Such positive teacher views were accompanied by positive weights on self-concept and nonverbal IQ. This factor seems to indicate that the social and intellectual abilities were perceived as tied together more closely in girls than in boys, at least in the present sample.

The final factor (8% of variance) for the Group B girls included a high loading on the Consequences Solution variable, with small loadings on self-concept and nonverbal IQ scores. Some of this same pattern was seen in the Group A boys (See Table 14, Factor 5). In a number of instances, the patterns of Group A boys and Group B girls seemed so similar that it prompted a check on the correctness of the identification column in the IBM data card deck. The multiple regression analyses will expand further on this peculiar similarity.

There was an impressive diversity in these two factor analyses which should lend caution to any attempt to generalize much of these findings. The relatively small samples and the analytic method itself obviously have created some of these findings, and their reproducability would be limited to say the least.

In the face of such diversity, there were some common findings in the two groups that do deserve attention. The Group B analysis essentially confirmed the Group A results in regard to the presence of a single factor of classroom expressiveness which included all the variables of classroom performance, but few additional associated variables. The divergent tests were found to be in a different factor from IQ scores in all groups. The sentence completion scores seemed to relate more closely to divergent scores than IQ scores. Divergent cognitive performance thus seemed more related to affective variables than to other cognitive variables. This point will be dealt with in some length in the Discussion section.[1]

What was the Relationship Between Cognitive Performance of Teacher and Student?

An attempt was made to answer this question by indicating the relationship between the kinds of major thought processes requested by the questions posed by the teacher and the proportion of various inferred thought processes produced by the students. The percentage of total questions in each of the primary categories asked for by the teacher was ranked from one to ten. In one instance, BAKER-CHARLIE, where the teacher was recorded in 20 sessions, the ranking was from 1 to 20.

The same class sessions were then ranked in terms of the percentage production in each of the thought categories, separately for the boys and the girls. For instance the ten sessions of FOX-GEORGE would be ranked in terms of the percentage of

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[1] The multiple regression analysis completed on same data can be seen in Appendix G.

TABLE 16

Spearman Rank Order Correlation

Student Performance vs. Teacher Performance

		Cognitive Memory	Divergent Thinking	Convergent Thinking	Evaluative	No of class+ Sessions
Teacher A vs.	Boys	75*	78	65	50	20
	Girls	58	72	48	47	
Teacher B vs.	Boys	57	74	76	80	10
	Girls	57	08	43	38	
Teacher C vs.	Boys	69	51	71	68	10
	Girls	90	71	91	55	
Teacher D vs.	Boys	77	80	77	62	
	Girls	77	62	48	43	10
Teacher E vs.	Boys	82	39	82	79	10
	Girls	88	60	83	56	

+Spearman Rank Order Coefficients significant at .05 level (one tail test)
Rs of .56 for N = 10
Rs of .38 for N = 20

*Decimal points omitted.

divergent thinking questions presented by the teacher, and then these classes would be ranked in order of the percentage of divergent thinking output presented by the boys and girls in these classes.

The relationship between these sets of ranks obtained for each teacher's class sections were then measured by a Spearman Rank Order Correlation coefficient. The results of these correlations between student performance and teacher questions may be seen in Table 16.

The statistically sophisticated reader will note that standard analytic techniques are sometimes utilized in this study in rather unorthodox circumstances. For example, in this Spearman Rank Order Correlation the results of two sections are combined in the analysis despite certain misgivings about fulfilling all of the assumptions for the use of that technique.

In each of these instances, the decision was made to use the best of available techniques (to the author's knowledge) and to take cognizance of the problem while accepting full responsibility for any misinterpretations that might occur due to the 'assumptions' difficulty. The Table 16 indicates a consistently high relationship between the thought processes the teacher asked for and the kind that the student gaves. In most instances, the positive relationship reached commonly accepted levels of statistical significance, and in no instance was a negative relationship found. In only one instance did the relationship approach zero. That was in the relationship between teacher B's request for divergent thinking and the divergent thinking production of the girls in this group. A closer examination of these particular class sessions showed that the boys had responded most consistently to requests for divergent thinking (as shown by the r of .74) whereas the girls appeared somewhat erratic in their responses to such questions. With that single exception there did not appear to be substantial differences between boys and girls in their responsiveness to the type of question asked for by the teacher.

In retrospect, this was not a surprising finding. If a teacher asks for the date on which Lincoln was shot, it would be difficult for a student to give a divergent thinking response. If a teacher asks for comparative judgment on the communication effectiveness of the novel vs. that of the short story it would be hard for a student to avoid an evaluative response. In short, the teacher has dominant control over the type of expressive thought presented in the classroom. Such a fact, presents teachers with special opportunities and special responsibilities.

Is Classroom Expressiveness Consistent in Gifted Children Over Time and Change of Subject Matter and Teacher?

Table 17 gives an indication of the consistency of classroom expressiveness in the present sample. A number of the students were recorded at different times in the same class, or in different classes with different content and teacher. In view of the previously observed relationship between teacher performance and the type of student production, there was a question as to whether any interstudent consistency could be noted from one recording period to another, or whether the results depended entirely on the teacher's style.

Data provided by three different samples of children were analyzed. The first group contained 39 students who had been attending two social studies classes. The two sets of observations were taken with the same teacher with one block of recordings made in the Fall and one in the Spring. A second group of twenty students were observed during Social Studies and again in Science class! A third group of 39 students had

TABLE 17

Consistency of Classroom Expressiveness in Gifted Students

Cognitive Variable	Social Studies (Fall) vs. Social Studies (Spring) (N=39)	Social Studies vs. Science (N=20)	Science vs. English (N=39)
Cognitive-Memory	40[1]	66	60
Divergent Thinking	31	31	44
Convergent Thinking	37	58	46
Evaluative	54	45	52
Conclusion	38	38	66
Explanation	27	67	57
Association	30	47	33
Qualitative	49	66	72

[1] All Pearson product moment r's (with decimal points omitted).

For N = 39 Pearson r of .30 significant at .05 level
N = 20 Pearson r of .43 significant at .05 level (Guilford, 1950, p. 609)

been recorded in science classes and were recorded again a year later in their English classes.

Pearson product moment correlations were calculated between their adjusted class scores (See pg. 120) in each of the groups. Table 17 indicates the result of these correlations. One striking observation can be noted in this Table, the unvarying positive nature of the correlations. No matter the class nor the cognitive variable, there was found some significant student consistency in terms of classroom expressiveness. In other words, despite the clear influence of the teacher on the thought processes produced, the students still maintained, to some extent, their own consistent style apart from this influence. As the Table indicates, the students were consistent even while moving from one class to another, as shown by the Science vs. English comparison. They showed greater consistency than students remaining in the same classes with the same teacher.

Of the four major categories used in the present study, Divergent Thinking production appeared to have the least stability. This would be consistent with the observation that it was the most succeptible of the primary categories to teacher initiation and influence. Cognitive-Memory, which seemed to be a necessary part of cognitive interchange of any classroom session no matter who the teacher or what the subject, seemed to maintain the greatest level of student consistency from one point in time to another.

The four categories at the bottom of the Table represented reorganizations of the subcategories used to obtain the results in the top part of the table. It should be noted that they too show consistently positive correlations. The Qualitative category is of particular interest for those concerned with cognitive style. It is made up of items which represented student interaction with another student by means of disagreement, or by attempting to amend a prior statement of student or teacher. If a student had a large number of items classified in this area it was interpreted as representing a personal willingness to enter into verbal conflict or disagreement with others. This characteristic showed a high degree of consistency in student performance from one class situation to another and substantiated the impression of observers that such willingness for verbal conflict was indeed a consistent characteristic of an individual from one time, and one class, to another.

Was There Teacher or Student Consistency Within Class Sections from Day to Day?

While Table 17 indicated student consistency in general expressiveness, there was a further question regarding the consistency of the level of expression of various thought processes within a particular class section. In order to calculate whether teachers or students varied from a general mean or expected level of performance during the space of a five-day week, the following procedure was used. A percentage was calculated for each of the thought processes used for each class session. That is, for each category such as Divergent Thinking, the sum of these percentages were calculated over the five-day period. A Chi Square was calculated, using for expected frequency the total percentage for the week divided by five. The null hypothesis stated that if no differences occured in the proportions of thought processes used from one class session to the next, then there would be relatively little difference between expected and obtained frequencies for each of the class sessions, and no statistical significance would be obtained. On the other hand, it would be necessary

TABLE 18

Differences by Chi Square on Proportions of Cognitive Expression within Five Class Sessions

	TEACHER QUESTIONS				TEACHER STATEMENTS			
Groups	Cognitive Memory	Divergent Thinking	Convergent Thinking	Evaluative Thinking	Cognitive Memory	Divergent Thinking	Convergent Thinking	Evaluative Thinking
Baker-Fall	6.26	$\underline{\underline{18.37}}$	1.08	4.60	4.11	5.17	3.43	5.00
Baker-Spring	$\underline{\underline{14.96}}$	4.43	$\underline{\underline{22.71}}$	8.44	3.39	4.50	6.70	3.46
Charlie-Fall	$\underline{\underline{13.96}}$	$\underline{\underline{41.80}}$	$\underline{\underline{14.21}}$	$\underline{\underline{23.20}}$	1.93	1.20	2.38	5.50
Charlie-Spring	1.65	$\underline{12.80}$	$\underline{11.31}$	4.50	5.66	4.17	$\underline{10.58}$	7.57
Dan	1.55	$\underline{\underline{17.20}}$	6.78	9.33	1.25	.50	2.09	$\underline{\underline{19.25}}$
Easy	6.13	2.50	$\underline{\underline{19.55}}$	7.60	1.16	4.33	.83	2.62
Fox	$\underline{\underline{23.35}}$	$\underline{\underline{13.00}}$	$\underline{\underline{24.12}}$	4.33	6.47	9.00	$\underline{\underline{24.91}}$	6.17
George	9.52	6.33	$\underline{\underline{14.34}}$	$\underline{\underline{21.00}}$	5.67	6.50	$\underline{\underline{20.50}}$	6.14
Hat	$\underline{\underline{34.55}}$	$\underline{\underline{37.33}}$	4.36	$\underline{\underline{31.47}}$	.93	1.67	4.35	2.18
Idea	$\underline{10.24}$	$\underline{\underline{16.50}}$	$\underline{\underline{22.13}}$	$\underline{\underline{16.83}}$	1.52	6.75	$\underline{\underline{10.39}}$	3.50
Jack	$\underline{\underline{31.21}}$	.00	$\underline{\underline{57.15}}$	$\underline{\underline{45.37}}$	5.31	2.00	4.29	8.44
King	7.14	$\underline{\underline{29.00}}$	7.44	$\underline{13.00}$	2.10	3.50	1.87	5.92

X^2 = 9.49 at .05 level

X^2 =13.28 at the .01 level

to reject the null hypothesis if one found large differences between obtained and expected performance.

Table 18 shows the results in terms of Chi Square findings within the five class sessions. A graphic portrait of the data being processed here can be seen in Figures 4-9. In order to clarify results for the reader those X^2's reaching the statistical level of .05 were underlined and those reaching the .01 level were underlined twice. In terms of the types of questions teachers ask, the results indicated rather clearly that the proportions varied considerably, within a particular class section, from one day to the next. They did not necessarily vary in the same way for each class section. For example, for the teacher in the BAKER section, the Divergent Thinking questions varied significantly in the BAKER-Fall section while the Cognitive-Memory and Convergent Thinking questions varied significantly for the BAKER-Spring section. Similar differences can be noted in the various subgroups.

For instance, in the DAN and EASY groups, significant differences were obtained on Divergent Thinking questions for the DAN section and for the Convergent Thinking questions for the EASY group. It should be recognized that these results on various thinking operations were not independent of one another since they were composed of proportions that added up to 100% across all of the thought processes. That is, a high percentage of divergent questions inevitably meant that there would be lower proportions in the other areas for a given day.

However, the general portrait was rather clear. These teachers varied their question-asking performance from one time to another, within the same class section, depending upon the pedagogical goals for a particular session. Differences were much less evident across class sessions when the teacher statements were considered. These represented statements made by the teacher not requiring an immediate response from the student. In this analysis a greater degree of consistency was obtained in teacher behavior from one session to another. In the BAKER-CHARLIE series, only the Convergent Thinking statements made in the CHARLIE-Spring section reached a level of accepted statistical significance. Only in the FOX-GEORGE sections did there seem to be some consistency from one class section to another. In both these sections, there was significant variation in the proportion of Convergent Thinking statements made by the teacher over the five sessions. This result would seem due to necessary teacher explanation that accompanied various science experiments that were executed in these two sections on various days.

It can be noted, in the JACK and KING sections, that the teacher remained internally consistent in proportion of kinds of teacher statements made over the entire five days. These results would indicate that variations in expressive thought of the teacher relate much more to their question-asking performance than to their statements. It was in the kinds of questions asked that one gets to see the different patterns of classroom operation.

Table 19 indicates the variation for students, both boys and girls, in the five sessions. The procedure for calculating the Chi Square was the same as used on the teacher data. The question-asking and statement-making performance data were combined for the students for reasons previously stated (See pg. 62). Variation again appeared quite wide and, for the boys, the area of Divergent Thinking seems to vary most from one class session to another. There were significant inter-session differences in the BAKER-CHARLIE series, and in one of the two sections

TABLE 19

Differences by Chi Square on Proportions of Cognitive Expression within Five Class Sessions

Groups	BOYS STATEMENTS Cognitive Memory	BOYS STATEMENTS Divergent Thinking	BOYS STATEMENTS Convergent Thinking	BOYS STATEMENTS Evaluative Thinking	GIRLS STATEMENTS Cognitive Memory	GIRLS STATEMENTS Divergent Thinking	GIRLS STATEMENTS Convergent Thinking	GIRLS STATEMENTS Evaluative Thinking
Baker-Fall	28.10	32.82	6.26	10.46	33.95	57.95	27.00	24.50
Baker-Spring	10.48	10.43	12.93	22.87	34.54	25.37	10.54	25.00
Charlie-Fall	16.84	27.86	3.00	7.20	29.31	33.36	32.48	11.08
Charlie-Spring	1.71	16.13	4.35	5.75	2.69	14.00	9.86	10.40
Dan	7.59	25.09	8.92	14.00	3.30	4.00	11.36	10.10
Easy	2.18	8.20	8.89	9.40	6.63	11.67	12.33	12.80
Fox	5.02	12.29	8.41	5.60	8.27	13.00	21.87	6.40
George	5.98	8.40	8.14	2.25	4.65	9.00	19.44	4.00
Hat	24.96	8.79	20.22	30.27	36.33	53.17	12.29	42.08
Idea	14.56	11.09	19.11	2.73	24.62	14.00	28.00	6.35
Jack	26.57	3.00	38.27	21.78	24.30	11.00	33.20	22.67
King	5.07	2.50	9.80	9.43	.66	11.00	6.62	32.00

X^2 = 9.49 at .05 level

X^2 =13.28 at .01 level

in each of the class groups except for JACK-KING where, it may be recalled, very little divergent thinking was expressed at any time during the session by the boys. In general, the student variations were rather closely tied to the variation in types of teacher questions.

An inspection of the girls' performance suggested that they varied even more from one session to another than did the boys, with a greater number of significant differences obtained across all groups. Again, the relatively few statements made by the girls in the Divergent Thinking category sharpened the differences between obtained and expected performance.

In terms of teacher behavior, these results indicated that a total sample of teacher behavior has to be relatively comprehensive since it cannot be assumed consistent from one class session to the next. This was particularly true for the type of questions asked. Therefore, it is necessary to observe teacher performance over a relatively long period of time. The same does not seem to be true of the teacher statements, in which the pattern seemed to remain relatively consistent, except for some special circumstances in the present small sample. In terms of the cognitive performance of the boys and the girls, the statement made regarding teachers can be reinforced even more strongly. The student performance, in terms of proportion of thought processes, varied by the day, and was affected substantially by the changing circumstances and class goals. In effect, these results represented statistical confirmation of the variance that can be observed by inspection in Figure 4-9 presented above.

Which Factors Influence Type of Production in Class?

Table 20 shows the results of a three-way analysis of variance investigating whether teacher performance in the primary thought categories, introduced in this study, were related to the group, the class section, or day of the week on which the recording took place. Group refers to all of the students assigned to one teacher such as FOX-GEORGE or JACK-KING. There were five teachers and six groups involved in the present analysis so that the degrees of freedom for groups was five. Each of the teachers worked with two classes of students at the same time covering the same subject matter. The authors wished to determine whether significant variation occurred in these various areas from one class session to another. Finally, various suggestions had been made that the teacher style and student style of performance might be influenced by the day of the week. This was also included as part of the total analysis of variance.

Table 20 shows the results of the analysis on teacher questions. It may be seen quickly that significant differences were obtained on all of these primary thought categories on the basis of group. This was merely confirmation of what many observers have indicated that teachers vary significantly among themselves in terms of the style of question asking in their classroom.

It can also be noted in the same table that, for the area of Cognitive Memory, the level of statistical significance was reached when one class section was compared with another. As can be noted in Figure 8, (pg. 71), there were particularly dramatic differences in the two social studies sections, HAT and IDEA. This difference may well account for this significant result by class section. There were no significant variations due to class section on any of the productive thinking categories. Neither was any significant variation found due to day of the week nor was there significant variation due to any of the interaction of the basic variables

TABLE 20

Analyses of Variance of Thought Processes Expressed by Group, Class and Day

TEACHER QUESTIONS

Source	df	Cognitive Memory Mean Sq.	Cognitive Memory F	Divergent Thinking Mean Sq.	Divergent Thinking F	Convergent Thinking Mean Sq.	Convergent Thinking F	Evaluative Thinking Mean Sq.	Evaluative Thinking F
Group	5	666.42	5.44**	99.18	3.64*	1391.15	14.58**	201.66	5.93**
Class	1	936.15	7.65*	.00	.00	448.27	4.70	98.82	2.90
Day	4	159.81	1.30	2.37	.10	166.72	1.74	27.81	1.81
Group-Class	5	216.31	1.77	11.02	.40	46.31	.48	43.50	1.28
Group-Day	20	261.91	2.14	29.13	1.06	191.56	2.01	29.50	.87
Class-Day	4	107.36	.87	29.89	1.10	31.72	.33	68.69	2.02
Residual	20	122.42		27.19		95.41		34.02	
Total	59								

TEACHER STATEMENTS

Source	df	Cognitive Memory Mean Sq.	Cognitive Memory F	Divergent Thinking Mean Sq.	Divergent Thinking F	Convergent Thinking Mean Sq.	Convergent Thinking F	Evaluative Thinking Mean Sq.	Evaluative Thinking F
Group	5	533.54	17.98**	37.31	14.51**	94.31	3.72*	108.51	7.81*
Class	1	132.02	4.45	4.27	1.66	38.40	1.52	7.35	.53
Day	4	85.40	2.88	1.44	.56	64.12	2.53	15.75	1.13
Group-Class	5	76.82	2.59	3.15	1.22	16.92	.67	54.51	3.92*
Group-Day	20	70.42	2.37	5.43	2.11	37.86	1.50	24.41	1.76
Class-Day	4	56.77	1.91	9.64	3.75*	28.19	1.11	28.43	2.05
Residual	20	29.67		2.57		25.31		13.89	
Total	59								

$* = p \leq .05$

with one another. Of the three variables being considered, the difference from one group to another seemed to be by far the most significant variable accounting for variation in all of the primary thought categories.

Table 20, also shows a similar analysis of variance using teacher statements as the basis for comparison. In the same way, variation due to group, class section and day of the week were considered together with all of the interactions of these variables. Somewhat similar results were found as discovered in analyzing teacher questions. Significant variation was found between groups on all of the primary thinking processes but no significant variance was found between class sections for any of the thought operations. Neither there were significant variations due to the day of the week.

There were two significant interactions obtained. One related to the combination of class session with the day of the week in Divergent Thinking and another, in Evaluative Thinking, on the combining of group with class sessions. It was felt that the small amount of certain types of statements expressed by some of the teachers in these groups made this significant interaction possible by unduly weighting the day of the week that such a series of responses did take place. No clear explanation can be given for the interaction between group and class on Evaluative Thinking except as part of the continued suggestion that the makeup of the youngsters in the classroom molds the behavior of the teacher and forces the teacher into a slightly modified style to take into account student idiosyncracies.

Table 21 indicates the analysis of variance done on the boys statements for the four major areas of thought processes by group, class section

TABLE 21

Analyses of Variance of Thought Processes Expressed by Group, Class and Day

BOYS STATEMENTS

Source	df	Cognitive Memory Mean Sq.	Cognitive Memory F	Divergent Thinking Mean Sq.	Divergent Thinking F	Convergent Thinking Mean Sq.	Convergent Thinking F	Evaluative Thinking Mean Sq.	Evaluative Thinking F
Group	5	319.15	2.90	530.42	12.52**	931.39	14.76**	109.71	5.78
Class	1	1306.67	11.87**	40.02	.94	340.82	5.40	123.27	6.50*
Day	4	96.56	.88	3.43	.10	67.90	1.08	50.19	2.64
Group-Class	5	134.22	1.22	27.22	.64	84.78	1.34	39.54	2.08
Group-Day	20	226.15	2.05	74.78	1.76	133.84	2.12	26.93	1.42
Class-Day	4	61.08	.55	36.60	.86	76.15	1.20	52.89	2.79
Residual	20	110.04		42.35		63.11		18.97	
Total	59								

GIRLS STATEMENTS

Source	df	Cognitive Memory Mean Sq.	Cognitive Memory F	Divergent Thinking Mean Sq.	Divergent Thinking F	Convergent Thinking Mean Sq.	Convergent Thinking F	Evaluative Thinking Mean Sq.	Evaluative Thinking F
Group	5	1083.56	7.46**	627.55	8.71**	890.83	8.06**	188.12	3.91*
Class	1	26.67	.18	17.07	.24	2.40	.02	.27	.00
Day	4	169.97	1.17	30.47	.42	55.39	.50	37.81	.78
Group-Class	5	157.02	1.08	7.51	.10	133.96	1.21	50.47	1.04
Group-Day	20	309.14	2.13	85.51	1.19	139.40	1.26	36.33	.75
Class-Day	4	257.21	1.77	75.44	1.05	167.44	1.51	22.56	.46
Residual	20	145.17		72.03		110.55		48.16	
Total	59								

* = $p < .05$

and day. In this respect, significant differences were found in the areas of Divergent Thinking and Convergent Thinking by group, again underlining the differences between groups in the present study. Two significant differences were found due to the particular class sections involved in the analysis in the areas of Cognitive Memory and Evaluative Thinking. It will be recalled in Table 20 analyzing the teacher's statements and questions, that there were significant differences by class section in teacher questions in Cognitive Memory and by teacher statements in Evaluative Thinking. This supports the general findings already discussed relating to the potential influence of the teacher upon the kind of statements made by the students. Again, neither the day of the week nor the interactions revealed significant variance influences.

Table 21 also shows the analysis of variance obtained on the various thought processes on the part of the girls in the present study. These results were consistent with the responses of the teachers and the boys in which the main significant variance was obtained between groups. In the case of the girls, neither the section to which they belonged nor the day of the week on which the recording took place had significant influence. Also, there were no significant interactions found between the major variables.

In total, this suggested that the major variance in the expression of different kinds of thought processes relate most strongly to the particular group which, in this case, meant the particular teacher. Occasionally, the membership of a class section appeared to have some influence on the kind of expressive thoughts of teacher and the boys but not the girls. The day of the week was not a significant variable nor was variable interaction particularly impressive for boys or girls or teacher questions although some interaction was found in the teacher statements in the areas of Divergent Thinking and Evaluative Thinking.

Was Sex a Relevant Variable on Classroom Expressiveness and Other Comparisons?

Table 22 shows the results of a comparison between boys and girls in amount of cognitive expressiveness related to the various thought categories in the six different sets of recordings taken in the present study. The mean scores in Table 22 represent the average number of responses made in the five consecutive sessions in each of the four major categories of Cognitive Memory, Divergent Thinking, Convergent Thinking and Evaluative Thinking.

A casual perusal of the Table would indicate that boys generally were more expressive in these groups, over all categories, than were the girls. However, such a statement needs some qualification. The BAKER-CHARLIE Spring group represented practically the same membership as the BAKER-CHARLIE Fall sample. The Spring data is really an indication of the stability of the Fall observations and should not be considered data from a new group. In the BAKER-CHARLIE Fall group there were clear differences between boys and girls in favor of the boys' expressiveness in all areas but that of Evaluative Thinking. However, the boys did appear superior in the Evaluative category in expressiveness in the Spring sample.

Some of these same youngsters (BAKER-CHARLIE) were also included in the DAN-EASY group and may well be responsible for some of the significant differences shown in this Table for the DAN-EASY group.

The FOX-GEORGE group, however, was a completely new set of students and the data indicates, that in every area, the boys were significantly more expressive than the girls. Even in the categories of Evaluative Thinking and Divergent Thinking, which were not called for frequently by the FOX-GEORGE teacher, the boys dominated what statements were made in those categories.

Verbal Classroom Expressiveness in Gifted Groups by Sex

	Cognitive-Memory		Divergent Thinking		Convergent Thinking		Evaluative Thinking		Total	
	Mean	σ	Mean	σ	Mean	σ	Mean	σ	Mean	σ
BAKER-CHARLIE Fall										
(N=23) B	16.78**	9.94	9.00**	5.74	7.43**	4.91	3.35	3.25	36.56**	19.15
(N=20) G	9.50	3.95	5.30	3.89	4.80	3.09	3.15	2.60	22.75	10.97
BAKER-CHARLIE Spring										
(N=22) B	26.27**	16.62	7.86**	5.60	11.14**	5.95	5.41**	4.24	49.77**	26.20
(N=17) G	11.59	9.17	4.12	4.00	6.06	4.75	2.23	3.13	26.00	18.39
DAN-EASY (N=14) B	27.71**	21.45	4.35**	4.94	8.71**	5.73	1.71*	2.13	40.57**	27.93
(N=19) G	12.84	11.03	.81	.99	2.58	2.93	.58	.69	16.95	14.08
FOX-GEORGE										
(N=28) B	25.36**	27.30	3.25**	3.58	21.14**	22.30	2.25**	2.43	52.00**	53.67
(N=28) G	10.82	15.76	1.00	2.00	6.64	11.22	.54	1.32	19.00	29.25
HAT-IDEA (N=24) B	16.04	12.67	4.88*	5.07	6.33	6.36	3.42	3.02	30.66	24.21
(N=16) G	17.44	10.81	2.81	2.20	5.69	5.63	3.63	3.59	29.56	20.16
JACK-KING										
(N=23) B	14.52*	15.04	.52	.73	10.09	9.05	2.26*	2.58	26.52*	23.57
(N=25) G	7.52	9.92	.32	.63	6.60	7.78	1.04	1.67	15.48	18.84

* $p < .05$
**$p < .01$

The HAT-IDEA group, which were Social Studies classes, theoretically similar to the BAKER-CHARLIE group, did not show the same superiority in expressiveness of boys to girls, despite the fact that these students were at the same age level as the BAKER-CHARLIE group and presumably picked from the same general population. Only in the area of Divergent Thinking were differences found in favor of the boys. While this supported the general notion that boys were inclined more to Divergent Thinking, the difference in total expressiveness was negligible.

In the JACK-KING group there were significant differences in favor of the boys' expressiveness in the areas of Cognitive-Memory, Evaluative Thinking and in Total responses. There was also a tendency for boys to be more expressive than girls in Divergent and Convergent areas, but these differences did not reach expected levels of statistical significance.

In terms of the sex of the teacher, men taught the FOX-GEORGE and HAT-IDEA groups, while women teachers taught the other sections. The sex of the teacher seemed less important than their attitude in encouraging responses. Attempts to explain such complex performance solely on the basis of sex of teacher should be discouraged.

Within the limits stated above, there seemed to be sufficient evidence to state that boys tend to be more expressive in the classroom in all of the primary categories than do girls. However, this result should not be expected in every group or class. In no single instance in this study did the girls even approach statistical significance in manifesting greater expressiveness than the boys in any category. Since factors relating to classroom expressiveness are obviously many and varied, it should not be expected that each class or group would show the same results.

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Table 23 shows the results of this analysis. In the comparison of seventy-nine girls and eighty-six boys the results are quite unequivical. On all of the primary thought categories the boys were found to be more expressive in the classroom than the girls. On Evaluative Thinking the difference was obtained beyond the .05 level of significance, but beyond the .01 level for the other three areas. As far as the present sample was concerned, it can be stated that these gifted boys were more expressive in all thought dimensions to the girls in the classroom discussion environment.

TABLE 23

Comparison of Boys and Girls Adjusted Scores on Classroom Performance

	Girls	(N=79)	Boys	(N=86)	t	p
	Mean	σ	Mean	σ		
COGNITIVE-MEMORY	27.24	25.60	42.60	34.64	3.23	.01
CONVERGENT THINKING	26.48	29.33	47.16	41.32	3.71	.01
DIVERGENT THINKING	26.02	32.26	52.56	52.16	3.94	.01
EVALUATIVE THINKING	31.16	37.59	43.90	42.74	2.02	.05

Table 24 show the sex differences in the current population on test measures and teacher ratings. The results are divided into Groups A and B on the basis of age differences and the use of different measures in the attitudinal area.

As reported in the earlier tables, there were no meaningful differences between the sexes in terms of verbal or non-verbal IQ, with the average score on these group intelligence test measures well into the expected range for a gifted population. The results on the Divergent Thinking were of particular interest since it represented one of the more decisive areas of difference in classroom expressiveness. The basic question was whether this observed classroom difference was due to basic thinking abilities of boys and girls, or whether this difference rested in the greater willingness to express ideas by the boys who may be considered more intellectually aggressive, with a greater role expectation for aggressive performance in class. If there were basic differences in thinking ability the boys should be superior in both classroom expression and in paper and pencil tests of Divergent Thinking; but if the role expectation was the determining factor, no sharp differences should be found between the sexes on the written tests.

Since there was considerable overlapping membership between groups a further step was taken to determine if there were true sex differences in classroom performance over the entire sample. In order to equate performance in various classrooms, since there were a wide diversity of production from one class to another, a weighted score for each student was determined by the following process. Each student's total production for the five day period was divided by the total output of his class and then multiplied by one thousand to eliminate decimals. In this sense we obtained an index score of what proportion of the Cognitive-Memory responses or Divergent Thinking responses, etc., were given by each student. In the case where a student appeared in more than one group, his or her performance in the first group results were used.

Sex Differences on Test Measures and Teacher Ratings

	GROUP A				GROUP B			
	Girls (N=36)		Boys (N= 47)		Girls (N=56)		Boys (N=50)	
	Mean	σ	Mean	σ	Mean	σ	Mean	σ
CA in Months	147.33	4.88	147.26	4.24	163.09	7.09	163.62	7.24
Verbal IQ	130.56	10.17	131.53	9.51	129.38	10.15	129.76	8.18
Non-verbal IQ	125.75	11.22	129.68	9.43	129.18	11.89	131.86	10.63
Uses Breadth	15.92	3.67	17.19	[illegible]	21.04	7.36	22.56	6.58
Consequences Breadth	13.28	3.00	14.00	.76	13.80	3.16	13.64	4.09
Consequences Solutions	43.28+	19.25	35.79	3.87	45.89*	13.88	39.78	16.40
Sentence Completion								
Self					23.32+	3.82	20.08	8.82
Fears					4.05	1.27	3.92	1.23
Time					5.89	1.81	6.16	1.82
Work Style					12.98	2.96	12.38	3.01
Family					12.95+	3.43	14.10	2.72
Other People					13.32*	3.40	14.52	2.29
Semantic Differential								
Mothers	72.78	5.08	71.53	6.82				
Fathers	71.83+	8.83	67.74	10.03				
Students	70.44+	8.58	66.94	9.27				
Work	67.06	9.15	67.21	8.20				
Competition	67.75	8.62	65.98	12.40				
Success	67.92	9.30	64.15	11.91				
Love	71.61	7.44	70.13	10.95				
Faith	71.67	7.61	71.34	7.78				
Imagination	71.42*	6.58	66.81	12.02				
School	69.47	8.17	69.19	10.57				
Teacher Rating								
Cognition	11.42	3.86	11.87	3.69	11.07+	4.33	9.68	3.63
Sociability	2.22	.68	2.34	.89	1.84**	.65	2.24	.80

+ $p < .10$
* $p < .05$
** $p < .01$

The evidence reported here suggests that the later explanation has some merit. There were no significant boy-girl differences between the mean scores on both the Uses-Breadth and Consequences-Breadth scores in either Group A or Group B. In both groups, however, differences approaching significance were obtained on the Consequences-Solutions scores. The Solutions score is a ratio of the total number of answers presented to the test question to the number which represent Solutions rather than Problems. These results suggested that, in both groups, the girls contributed a significantly greater proportion of Solutions to their total answers to the Consequences test than did the boys. For example, if the question was, 'What would happen if everyone in the world were born with three fingers and no thumb?', a Problem answer to that proposition, would be that 'People would have a hard time opening doors', while a Solution answer in the same dimension would be 'The doors would have to be re-designed', or 'Pushbutton doors would become common.' Thus, it was considered that solutions would represent a more intellectually mature reaction to the test proposition and, in this case, the girls seemed superior to the boys.

On the measures of attitude and self-concept, the results obtained were fairly consistent with previous studies on sex differences. In group A, with the use of the Semantic Differential, the girls, generally, appeared to be more positive concerning most of the concepts than did the boys. Since the highest positive score obtainable would be 84, and a mid-point score would be around 50, one can see that all groups were leaning in a strong positive direction on all of these concepts. However, the girls seemed to be significantly more positive, at a probability level of .10 on the concept of Fathers and at the .05 level on the concept of Imagination, in Group A. In terms of this gifted group, the boys rated the concepts of Competition and Success relatively less positive in their scores than concepts of Faith and Mothers.

However, in Group A, no significant difference was found between boys and girls on the teacher ratings on either the ratings of cognition or sociability.

In Group B, on the Sentence Completion measures, significant differences were obtained between boys and girls on three of these six general areas. Since low scores represented a more positive orientation, these results indicated that the girls appeared to have a significantly lower Self-Concept and felt less positive about themselves than did the boys. On the other hand, the girls expressed a more positive orientation and viewpoint towards Family and towards Other People. No differences were found in terms of the amount of Fears or Time Orientation (positive attitude to future or past), or in their attitude toward such concepts as creativity, competition, etc. In a sense, these results confirmed some of the semantic differential results obtained for Group A. In total, it suggested that the girls were slightly less sure of themselves than the boys, but were more positively oriented towards other people. This greater social orientation was revealed in teacher ratings where the girls were ranked as significantly better in the social dimension than the boys by the teachers at a probability level beyond .01. On the other hand, the teachers rated the boys better in cognition with the difference significant at the .10 level of probability.

Another factor that may have a bearing on the differences in the teacher ratings from Group A to Group B may have been the particular subject matter. The Group B classes were concerned with Science and grammatical structure in English whereas Group A was composed of Social Studies classes. A case could be made, based on general observation, that the girls responded better, from a cognitive standpoint, in the Social Studies area than they did in Science and English. Thus, a better rating for the boys would be expected from the Science and English teachers in the cognition dimension.

Overall, the results of this study strongly indicated significant sex differences in the many of the variables included in the present study. The major difference seemed to lie in the attitudinal and self-concept dimension, but these attitudes towards self and others apparently can play a role in classroom performance. While differences were apparent within the classroom in the performance of boys and girls, it appears, on the basis of the present study, that these differences related more strongly to attitudinal and motivational differences than to basic cognitive differences.

Were There Differences between Cognitive Style Subgroups?

The highly publicized report of Getzels & Jackson (1962), and later replications of that work by Torrance (1959), has generated considerable interest in the 'divergent thinker.' In the present project, the opportunity presented itself to add more data to the general question of differences in congitive style. Since the procedure used to select the students was slightly different than that used by Getzels & Jackson and Torrance it is reported here in some detail.

The selection criteria for these groups were slightly more stringent in the present study than in past research and was arranged to create the maximum differences between groups. In each class section, children were ranked in order of their performance on measures of divergent thinking (Uses and Consequences breadth scores) and on IQ tests. Each class group was divided into a top third, middle third, and low third in regard to performance on these measures. Students who fell into the top third on IQ scores but in the bottom third on scores of divergence were placed into the High IQ--Low Divergence group. Similarly, those who scored in the top third on divergence but in the bottom third in IQ were placed in the Low IQ--High Divergent group. Numerous critiques of the original work by Getzels & Jackson have presented the suggestion that any such comparison should include the High IQ--High Divergent group, which should represent the most desirable cognitive pattern. Accordingly, this third group was added to this comparison, namely those youngsters who scored in the top third on both IQ scores and tests of divergent thinking.

These more stringent requirements, plus the division of the youngsters on the basis of sex, resulted in smaller but more defensible subgroups. The divisions of the sample, by sex, were necessary because of the differential results obtained there.

While some evidence exists as to the differences in test performance or in teacher ratings obtained by students manifesting these various cognitive styles, no evidence has been available related to the differential classroom performance of youngsters who presented differences on tests of cognitive style.

Table 25 shows the relationship of cognitive style and classroom performance in terms of the adjusted scores on the four primary categories on the present study. The significant differences noted in the table were obtained on a basis of a Mann-Whitney U test (Siegel, 1956) since the small N and wide variations argued against the use of the 't' test in this comparison. It can be noted that no significant differences, or differences approaching significance, were obtained on any of the cognitive

Table 25

Cognitive Style Related to Classroom Performance by Adjusted Classroom Scores

Classroom Expressiveness		BOYS High IQ-- High Divergent	BOYS High IQ-- Low Divergent	BOYS Low IQ-- High Divergent	GIRLS High IQ-- High Divergent	GIRLS High IQ-- Low Divergent	GIRLS Low IQ-- High Divergent
	N	9	10	14	10	11	14
Cognitive Memory	Mean	59.33	52.10	51.21	54.60	34.18	47.36
	σ	65.62	39.09	45.23	48.68	29.92	37.54
Divergent Thinking	Mean	66.11	49.50	51.00	87.60 **	19.18	33.71
	σ	47.37	35.60	80.38	77.78	24.97	46.27
Convergent Thinking	Mean	61.02	59.60	48.64	81.60 **	16.00 *	47.36
	σ	58.48	43.93	45.33	62.55	15.14	44.39
Evaluative Thinking	Mean	55.56	52.90	66.50	* 92.90 *	33.45	34.93
	σ	42.27	49.80	91.49	122.68	53.11	52.34

*Significant at .05 level of confidence.
**Significant at .01 level of confidence.

style subdivisions among the boys. In other words, whether the boy was classified as High IQ--High Divergent or Low IQ--High Divergent or High IQ--Low Divergent did not make any difference in terms of the performance of the student in the class, on any of the major dimensions.

The same cognitive style classification among the girls, however, did make a substantial difference in classroom performance. Although there were no differences between the three groups of girls on Cognitive-Memory expression, there were clear differences in the area of Divergent Thinking between the girls classified as High IQ--High Divergent and those classified as High IQ--Low Divergent with the High--High girls being more expressive. Similar findings were found between these same two groups of girls on the characteristics of Convergent Thinking and Evaluative Thinking. Thus, it appeared that on the three major areas of productive thinking, the High IQ--High Divergent girls were significantly more expressive than were the High IQ--Low Divergent girls. This would appear reasonable on the basis of the a priori expectations that the High IQ--High Divergent girl would contain the best traits of both dimensions and would thus be the more effective student. However, such was not found to be the case among the boys.

In the comparison of the High IQ--Low Divergent girls vs. Low IQ--High Divergent girls only one significant difference was obtained. Surprisingly enough, this difference was not obtained on Divergent Thinking as one might expect, but on Convergent Thinking with the girls classified Low IQ--High Divergent being significantly more expressive than those girls labeled as High IQ--Low Divergent. One difference was also obtained between the High IQ--High Divergent group and the Low IQ--High Divergent group on Evaluative Thinking. The dimension of High IQ in this regard seemed to influence the amount of Evaluative Thinking which is done.

It hardly needs to be pointed out, on the basis of these data and other collected in this study, that the relationship of cognitive style to classroom and test performance has to be qualified in terms of the particular sex involved.

Table 26 indicates the differences between groups of different cognitive style on teacher ratings of cognitive ability and sociability. It should be noted that all of the groups obtained what can be considered favorable ratings on both of these areas. A midpoint score on the scale of cognitive abilities would be represented by a score of 15 and a midpoint score on the scale of sociability, would be represented by a score of 2.5. The mean scores of all of the subgroups were considerably lower than the midpoint (a low score means more favorable rating), indicating the favorable tone of the teachers' ratings toward all of the subgroups in this sample.

Nevertheless, the comparison of the subgroups by t test did reveal certain differences. On the basis of the previous work by Getzels & Jackson, it was thought that one of the expected differences would be a more favorable rating for the High IQ--Low Divergent youngster than for the Low IQ--High Divergent youngster.

As can be seen in Table 26 these tendencies did occur in the case of the boys. The difference that was obtained was established between the probability level of .10 and .05 in the direction of the more favorable attitude on cognitive abilities for the High IQ--Low Divergent boy. As a matter of fact, the boys who fall into the High IQ--Low Divergent category also were rated more favorably on cognitive abilities than the girls who fell into this same cognitive style category. These boys were given as high a rating on their cognitive performance as seemed possible.

Table 26

Difference between Cognitive Style Groups by Teacher Ratings on Cognition and Sociability

			Teacher Ratings			
			Cognitive Abilities		Sociability	
Cognitive Style Group	Sex	N	Mean	σ	Mean	σ
High IQ--	B	9	10.44	3.08	2.22	1.09
High Divergence	G	11	9.00	1.73	1.64	.81
High IQ--	B	10	8.10	3.17	2.10	.74
Low Divergence	G	11	10.91	5.02	2.09	.83
Low IQ--	B	14	11.21	5.03	2.21	.17
High Divergence	G	14	11.57	3.58	2.07	.83

Differences beyond .05 level between:

High IQ--High Divergent Girls vs. Low IQ--High Divergent Girls on Cognition
High IQ--High Divergent Girls vs. High IQ--High Divergent Boys on Sociability

Differences between .10 and .05 level:

High IQ--Low Divergent Boys vs. Low IQ--High Divergent Boys on Cognition
High IQ--Low Divergent Boys vs. High IQ--Low Divergent Girls on Cognition

At an even more significant level, differences were found between the High IQ--High Divergent girls and two of the other subgroups. They received higher ratings on cognitive abilities than the Low IQ--High Divergent girls and were rated at a higher level of sociability than the High IQ--High Divergent boys. In general, it can be seen that the girls who fall into the presumed most ideal category of High IQ--High Divergent were highly thought of, both on the cognitive and sociability levels, by the teacher. The boys who fell into High IQ--High Divergent category were less favorably seen. The High IQ--Low Divergent boys received the most effective rating on cognition while the Low IQ--High Divergent boys received less effective ratings in cognition. Their sociability ratings were not superior to the other subgroups either.

Table 27 reveals the comparisons of the cognitive style subgroups on the Semantic Differential scale used in the present study. As in the case of the other analyses, the samples were divided by sex and this division revealed rather interesting differences. Differences were obtained and some consistent trends noted, despite the small samples involved in the comparison. With the boys, there was a significant difference obtained between the High IQ--Low Divergent group and the other two subgroups on the concept of WORK.

This single concept received the lowest mean rating by a large margin of all the concepts for the High IQ--Low Divergent group. In addition to the concept of WORK, the High IQ--Low Divergent group also was less favorably inclined on the concepts of MOTHERS and FATHERS than were the High IQ--High Divergent group. This difference was obtained only at the .10 level of significance but did seem surprising in view of the expectation that the High Divergent children would be more negative toward school and

Table 27

Comparison of Cognitive Style Subgroups on Semantic Differential

Concepts	BOYS						GIRLS					
	High IQ-- High Divergent N=9		High IQ-- Low Divergent N=10		Low IQ-- High Divergent N=13		High IQ-- High Divergent N=11		High IQ-- Low Divergent N=9		Low IQ-- High Divergent N=14	
	Mean	σ	Mean	σ	Mean	σ	Mean	σ	Mean	σ	Mean	σ
MOTHERS	74.33	7.33	$^{+}$68.60	6.80	72.69	6.51	71.18	5.25	*75.78	2.44	73.86	5.66
FATHERS	72.89	5.75	$^{+}$66.50	9.54	69.23	10.57	70.18	10.10	75.33	5.12	71.14	10.17
STUDENTS	67.22	6.51	64.00	11.86	68.08	9.38	66.81	9.06	71.78	6.63	68.79	8.99
WORK	65.11	6.75	$^{+}$56.70	12.31	*69.08	7.39	64.55	7.03	68.78	5.91	67.07	10.19
COMPETITION	71.44	10.33	68.20	8.26	66.23	9.51	70.36	7.61	69.89	4.57	68.64	8.03
SUCCESS	67.11	8.52	62.80	10.09	69.77	10.64	68.00	9.53	70.00	6.98	70.36	9.37
LOVE	67.11	12.42	67.50	10.44	66.54	12.39	69.91	6.92	73.11	6.07	69.36	7.34
FAITH	69.67	6.82	66.10	9.68	71.62	7.22	71.91	11.48	75.00	5.89	73.79	7.36
IMAGINATION	66.00	6.22	62.50	12.42	67.77	10.78	67.73	8.17	68.44	3.94	67.21	9.52
SCHOOL	66.56	14.77	65.30	7.94	69.46	6.62	71.00	8.46	73.78	6.26	70.64	7.74
TOTAL	68.74	9.01	64.82	10.15	69.46	9.15	69.16	8.42	72.19	5.86	69.66	10.35

*p $<$ .05 - High Divergent--Low IQ $>$ Low Divergent--High IQ on concept of WORK

$^{+}$p $<$ .10 - High IQ--High Divergent $>$ High IQ--Low Divergent on concepts of MOTHER, FATHER, WORK

*p $<$ .05 - High IQ--Low Divergent $>$ High IQ--High Divergent on concept of MOTHER traditional elements in our society including members of the family. These expectations were not realized with the Low IQ--High Divergent groups either.

No differences were obtained at all between the High IQ--High Divergent group and the Low IQ--High Divergent group. As far as the boys were concerned, it was the characteristic of divergence, low or high, which determined the few differences that were obtained in these comparisons.

Of the ten subscales, the High IQ--Low Divergent group obtained a higher mean score than the Low IQ--High Divergent group on only two concepts. These concepts were COMPETITION and LOVE. There is reason to believe that this result fits into the general pattern that the High IQ--Low Divergent boys see the world as a rather harsh place in which competition thrives and in which working hard is a necessity to reach one's goal. However, one does not have to like 'work' as a consequence.

In comparison only one difference was found between the various girls' subgroups. This was obtained also on the concept of MOTHER. The High IQ--Low Divergent group was significantly higher in their ratings of MOTHERS than were the High IQ--High Divergent groups. Although the High IQ--Low Divergent group tended to be slightly higher on mean scores than the other two groups on other concepts, the tendencies were quite slight. No differences were obtained on comparisons of High IQ--High Divergent and Low IQ--High Divergent for the girls.

In general, it can be concluded that there were only minor differences obtained on the Semantic Differential in terms of concepts and these few differences centered around attitudes toward parents and towards the concept of WORK. Other presumedly relevant concepts such as SCHOOL, IMAGINATION, STUDENTS and SUCCESS brought forth no differences of importance.

What Were the Differences between Expressive and Non-expressive Students?

A final subgroup comparison was attempted by comparing the extremes within the sample of the expressive and non-expressive students. Since the factor analyses reported above suggested that there was only the factor related to classroom expressiveness, an attempt was made to differentiate students on this basis by choosing the top third of the sample in classroom expressiveness on the basis of the adjusted classroom scores and comparing them with the bottom third of the group on adjusted classroom scores on a number of different variables.

Table 28 indicates the comparison of expressive and non-expressive students in the present sample on cognitive factors and teacher ratings. In general, only small differences, or no differences of consequence, were found on the measures of cognitive performance. There was a difference found at the .10 level of confidence on verbal IQ, with the more expressive boys tending to obtain a higher verbal IQ score than the non-expressive boys. No differences on this variable were found among the girls however. Similarly, no differences were found on the non-verbal IQ socres or on the divergent thinking scores obtained on the present sample.

Although the traditional levels of statistical significance were not found on the Solutions score on the Consequences Test there seemed to be a difference in direction. The most expressive boys gave the greater number of solutions on the Consequences Test while the most expressive girls gave a lesser proportion of solutions than their non-expressive counterparts.

In the area of teacher ratings of cognitive ability, significant differences were found between the expressive and non-expressive for both the boys and girls. In both instances, the expressive youngsters

Table 28

The Comparison of Expressive and Non-expressive Gifted Students on Cognitive Factors and Teacher Ratings by Sex

		Expressive			Non-expressive		
Variables	Sex	N	Mean	σ	N	Mean	σ
Verbal IQ	B	27	133.00$^+$	9.56	27	128.44	7.93
	G	27	128.22	10.46	29	127.24	9.36
Non-verbal IQ	B	27	129.33	7.62	27	129.89	8.45
	G	27	128.81	11.14	29	127.69	11.21
Uses Breadth	B	26	21.58	6.46	27	19.67	5.53
	G	27	19.96	8.03	29	17.48	5.67
Consequences Breadth	B	26	15.00	3.90	27	14.11	3.47
	G	27	13.78	2.65	29	13.48	2.89
Consequences Solutions	B	26	39.88	18.81	27	31.78	19.22
	G	27	41.04	20.05	29	47.52	17.82
Teacher Rating (Cognition)	B	26	8.65**	3.39	27	11.74	4.11
	G	27	10.56*	3.77	29	12.86	4.57
Teacher Rating (Sociability)	B	26	2.31	.79	27	2.41	.93
	G	27	2.00	.62	29	2.00	.76

$^+$Significant at .10 level of confidence
*Significant at .05 level of confidence
**Significant at .01 level of confidence

were given higher ratings on Teacher Ratings on cognitive ability. It can be argued, of course, that this very expressiveness in class influenced or directed the teacher's judgment in this respect. However, the teacher's favorable rating of these youngsters did not carry over into the sociability dimension. No differences were found on the ratings of social success between the two groups and no trends were noted. Overall, it was found that the differences on cognitive factors, between expressive and non-expressive youngsters in this group were not very impressive.

Table 29 shows the comparison between expressive and non-expressive students on their performance on the Semantic Differential scale. Again, substantial sex differences can be noted. With the girls, differences were obtained only on one characteristic--that of Competition. This would suggest at least that girls who have better feelings toward competition are the ones able to interact verbally in the classroom. In terms of boys, there were four differences found on the concepts of Mother, Success, School and Work. All of these results were consistently in the same direction with the Non-Expressive student producing significantly higher ratings for these concepts.

It could not be said that the Expressive group was rating these concepts negatively since a neutral score would be 49. It would be more accurate to say that they are less positive in their attitudes to these concepts. One plausible explanation these sex differences would be to suggest that the expressive boys have more self-confidence and self-assurance and thus are not driven to give extremely positive ratings on these concepts. It can be suggested that students who were less sure themselves and less inclined to independent judgment may rate concepts such as Mother and School as extremely positive.

Table 29

The Comparison of Expressive and Non-Expressive Gifted Students on Semantic Differential Scale

		Expressive			Non-expressive		
Concepts	Sex	N	Mean	σ	N	Mean	σ
MOTHER	B	25	68.84	6.18	26	74.26**	5.41
	G	25	72.32	5.93	28	72.17	5.18
FATHER	B	25	66.36	9.40	26	70.50	7.93
	G	25	70.16	8.49	28	70.25	7.30
STUDENT	B	25	63.88	9.71	26	65.34	7.51
	G	24	67.12	7.75	28	67.89	7.26
WORK	B	25	63.60	6.54	26	67.73^{+}	8.20
	G	25	66.56	7.87	28	64.92	8.66
COMPETITION	B	25	66.28	9.32	26	67.61	13.77
	G	25	69.04*	6.57	28	64.53	8.85
SUCCESS	B	25	59.72	11.76	26	70.84**	8.07
	G	24	66.83	9.20	28	67.50	8.58
LOVE	B	25	66.76	9.81	26	70.65	9.02
	G	25	69.80	7.07	28	68.42	7.18
FAITH	B	25	67.72	9.14	26	72.11	9.06
	G	25	76.66	8.29	28	73.17	7.60
IMAGINATION	B	25	66.60	7.31	26	62.15	14.72
	G	25	68.96	9.63	28	65.85	7.39
SCHOOL	B	25	65.72	10.40	26	71.69*	7.20
	G	25	70.24	7.10	28	68.46	7.52

$^{+}$Significant at .10 level of confidence
*Significant at .05 level of confidence
**Significant at .01 level of confidence

Table 30 shows the comparison between expressive and non-expressive students in terms of their performance on the Sentence Completion Test. On this test, a low score represents a positive performance. In the comparison with the girls, two differences were found: (1) in favor of the expressive girls having a more positive Self-Concept and (2) also more positively viewing concepts such as Imagination, Competition and Creativity than non-expressive girls. This would support the general notion that the expressive girls possessed more positive self-concepts and self-assurance which enabled them to perform effectively in a class situation even when this type of expressiveness was not predominantly a feminine role.

Only one difference was found in the boys, again consistent with the Semantic Differential results. The expressive boys were not as positive in their attitudes to their family as were their non-expressive boys. There was the hint of possible dependency relationship in the non-expressive boys that may hinder them from entering into the more competitive environment of classroom interaction. It can be noted, although significant differences were not obtained, the direction of differences on family ratings for the girls was the reverse of the boys, with expressive girls leaning in a more positive direction to their parents. This supported the idea that it is the well-adjusted, well-rounded girls who participate in classroom interaction.

Table 30

The Comparison of Expressive and Nonexpressive Gifted Students on the Sentence Completion Test

Sentence Completion Variables	Sex	Expressive			Non-expressive		
		N	Mean	σ	N	Mean	σ
Self	B	24	21.41	4.15	27	20.92	4.16
	G	24	20.96^{+}	4.13	29	23.21	4.13
Fears	B	24	3.91	1.53	27	3.74	1.20
	G	24	3.88	1.15	29	4.28	1.25
Time	B	24	6.50	2.22	27	5.96	1.56
	G	24	5.67	1.63	29	5.68	1.91
Work Style	B	24	12.00	3.45	27	10.74	2.86
	G	24	10.50**	2.90	29	12.89	3.06
Family	B	24	13.41**	3.33	27	11.15	3.74
	G	24	10.92	3.56	29	12.44	3.74
Other People	B	24	14.20	4.29	27	14.30	2.44
	G	24	13.25	2.29	29	13.62	2.99

$^{+}$Significant at .10 level of confidence
*Significant at .05 level of condidence
**Significant at .01 level of condifence

Results Summary

1. In the broad classification categories, there were certain similarities in the types of teacher questions and responses in almost all class sessions. The greatest proportion of teacher responses and questions fell in the Cognitive-Memory category. The second most utilized category was that of Convergent Thinking. It would appear that almost all classroom discussions, regardless of individual teacher style, would have a substantial proportion of Cognitive Memory and Convergent Thinking as necessary components of classroom performance. Lesser proportions of responses and questions were obtained in the categories of Divergent Thinking and Evaluative Thinking. In certain instances, they were absent from an entire class session. Whether or not these categories are included appeared to depend upon personal teacher style, as well as the content area.

2. An extremely close relationship was obtained between type of teacher questions and type of student responses. Except for some idiosyncratic responses on the part of a few students, it was clear that the character and style of verbal behavior in the classroom was mainly directed by the teacher. The secondary categories revealed even more striking teacher differences in such areas as Conclusion Asking or Stating, Explanation, Requesting Facts, etc. Impressive individual teacher differences were obtained, in addition, on such non-cognitive variables as the ratio of Ver+/Ver- and Humor. A close relation was found also between teacher performance and student performance in these categories.

3. Meaningful differences were observed between teachers in terms of the types of questions asked and the types of statements made.

Questions and answers appeared to serve different purposes for the teacher. The questions determined the type and kind of response requested from the student and was used by the teacher to advance curriculum goals. The teacher statements represented a particular individual style of presentation of information.

4. Notwithstanding the important influence on student production by the teacher, a consistent pattern of expressiveness or non-expressiveness was discovered among these gifted students. Despite changes in content area and teachers, positive relationships were obtained on expressiveness from the same students, observed in different classrooms, or at different times in the same classroom.

5. Expected differences between students on performance in the major categories of Divergent Thinking, Convergent Thinking, etc., did nor occur. A student who performed well in one category tended to be superior in them all. The nature of thought expression in the classroom was more complex than originally hypothesized and required effective use of all major thought categories used in the present study.

6. Teachers have distinctive styles that can be identified and which may vary significantly from one class group to another. It was also determined that teachers can vary in the proportion of different thought processes they request from one group, and even from one class session, to another. Accordingly, it would be difficult to characterize the teacher's behavior without indicating the particular group of students or the class progress at a given point in time.

7. Significant sex differences were obtained on classroom expressiveness and general attitudes toward self and others. Generally, the boys tended to be more expressive across all dimensions in the classroom

and to be more confident in their own abilities. The girls seemed to be more positive in their attitudes toward others and expressed a more positive attitude toward the world around them.

8. While sex differences were obtained on verbal expressiveness, no great differences were obtained on tasks related to written performance. Such results lent credence to the hypothesis that superiority in verbal expressiveness in the classroom relates more to personality and attitudinal dimensions than to cognitive ability.

9. In this group of gifted students, IQ scores did not seem to be a significant variable. It was not related to classroom expressiveness nor did it play a role with dimensions of attitude and personality. It must be remembered that this was a most restricted population in terms of IQ range.

10. Performance on the divergent thinking tests was related only partially to classroom expressiveness, but did seem to have consistent relationships to the various measures of self-concept and attitude. In boys, good performance on divergent thinking tests seemed related to a degree of social independence and nonconformity. In the girls, good performance on divergent thinking tests was more related to a total pattern of good academic performance.

11. Significant differences were obtained on the basis of cognitive style. Teachers rated boys who were classified Low IQ--High Divergent less well than High IQ--Low Divergent boys on cognitive abilities. In general, the girls rated High IQ--High Divergent received more favorable teacher ratings than the High IQ--High Divergent boys and the Low IQ--High Divergent girls. The High IQ--Low Divergent boys seemed to have a much less positive attitude toward the concept of Work. This

raised the possibility that their acceptance of the goal of academic achievement and their drive toward academic attainment (work?) was not without its cost in terms of underlying attitudes.

12. The High IQ--High Divergent girls also were significantly more expressive in the classroom than were the other two groups of girls. This supported the general notion that those girls who were superior in IQ and on divergent thinking tests were the most self-confident and expressive in their academic performance.

13. In comparing the top students in classroom expressiveness with the less expressive, it was found that the differences rested more in the attitudinal dimension than in the cognitive realm. There was a hint that dependency feelings in the boys, which may hinder aggressive classroom interaction, might have been revealed by an extreme positive attitude to school, parents, achievement, and other concepts seen to be related to an academically conforming pattern.

DISCUSSION

The results of this omnibus project have produced implications along a number of different dimensions. Among these are cognitive structure and process, cognitive style, the development of measuring instruments, the implications of sex differences, and the teaching environment of the classroom. Each of these will be discussed in turn.

Cognitive Structure and Process

The experience of the project strongly supported the need for a theoretical model from which to organize and process information gathered in the study. Without such a model as Guilford's Structure of Intellect it would have been difficult to make any sense of the vast amount of complex information gathered in this study. At the same time, the use or application of such a model often raises certain doubts about the completeness or appropriateness of the model itself.

The meaningfulness of theories of behavior developed in the laboratory depend to a large extent on how well they deal with the more complex relationships outside of the laboratory. It should be noted that Guilford (1958) fully recognized such complexity in discussing the creative process.

> "No creation takes place in a vacuum. We cannot create unless we have the background of information with which to create. This implies a history of cognitions and of memory for those cognitions. Furthermore, to be completely effective as a creative person, one must exert some degree of evaluation. Too much evaluation applied too early is, of course, detrimetnal but there is one special role of evaluation that must be pointed out.

> The act of evaluation leaves us satisfied with our results or it leaves us dissatisfied. If we are too easily satisfied we miss opportunities for making important corrections and improvements and the general opportunity to grow." (p. 6)

As noted in the Procedure section, there were some doubts raised about the legitimacy of claiming that there were different mental operations required for the dimensions of convergent and divergent thinking. For example, a student is shown a balloon in a bell jar. The laboratory assistant manipulates some type of valve and the balloon alternately gets larger and smaller.

CONVERGENT QUESTION	DIVERGENT QUESTION
Why does the balloon get smaller?	How many different solutions can you produce to explain what you see?
STUDENT ANSWER	STUDENT ANSWERS
If the balloon's size is determined by pressures internal and external to its surface.	Air is being pumped out of the bell jar.
And the balloon is changing size.	A heavier gas is being pumped inside the balloon.
Then the pressure on the outside of balloon must be changed.	It is an optical illusion.
Therefore the lab assistant must be manipulating air pressure within the bell jar.	There is another balloon within the first balloon that is being manipulated.
	etc., etc., etc.

It should be clear that each of the answers to the divergent questions are merely the 'therefore' statements of a logical syllogism of the same type that was spelled out to answer the convergent question. The mental operation that the student must perform upon the information is of precisely the same order in both questions but on the divergent question he is asked to do it more than once. In a very real sense, the responses to divergent thinking questions are products for which mental process has been inferred.

A further implication is that less likely solutions will have to be sought to increase the total output in the divergent situation. If there is a difference between the two categories, the difference lies in the strategy of seeking many different answers to the divergent question but this is less a mental operation on the available information than it is a search for alternatives. As noted before, this suggests that divergent thinking becomes more a style than a separate mental operation.

It should also be clear that a sizeable amount of prior information regarding the items involved in the problem needed to be available to the student before he can successfully deal with the question, in either the convergent or divergent framework. Thus, while memory is orthogonal or independent from divergent and convergent thinking in the Guilford model, it is rarely or never independent when the solution to a specific problem is demanded. This is the real reason for the high intercorrelations found between the major thought categories in classroom expressiveness.

One shouldn't overlook the role played by Evaluative Thinking in the two solutions to the question about the balloon noted above either. In the answer to the convergent question, he must weigh the appropriateness of each step in the reasoning process to see if it fits previous knowledge.

Thus, the individual asks himself questions at each stage of the thinking process. 'Is it true that the balloon's size is determined by pressures on its surface? Perhaps there is another way. No! This is the most reasonable answer. Continue on with your reasoning.'

In the divergent question a student applies Evaluative Thinking in determining the number and kinds of responses he will report to the questioner. Consider the following line of thought. 'Perhaps there is a little man inside the balloon alternately stretching and folding his arms. Should I report this as one of my solutions or not?'

The evaluative decision not to report such far-out solutions will reduce the student's score on divergent thinking. No wonder there is reported a relationship between divergent thinking and mental playfulness! Another way of looking at mental playfulness is that it represents a disinterest in applying strict evaluative standards to the output. The humor of the ridiculous is of a similar stripe.

The conclusion of this study then is that the model of the 'structure of intellect' is not correct when commonly pictured as a cube in which there are independent categories of cognition, memory, divergent thinking, convergent thinking and evaluation across the Operations dimension. Even in a laboratory situation there appears to be an intimate interrelationship between these mental operations that can be obscured only by the very special nature of constructed tests and the particular methods of analysis used to develop the model.

There has been some thought given to an alternate model that may describe thinking operations in a way that might be more suitable for describing problem solving situations. One of the potentially fruitful sources for models regarding thinking operations have been analogies drawn from computor operation even though such analogies have obvious limitations in direct application. The thinking apparatus of the human being goes through a complex maturational process, which undoubtedly changes the rules regarding information processing from one developmental stage to the next. The human being is also able to change his own search techniques when standard methods do not seem to apply.

Nevertheless, it does seem possible to divide thinking operations into four major dimensions, storage, scanning, matching and logical operations, that have rough analogies to computor functioning.

Storage refers to retrievable information which has been previously stored by the individual in his complex memory system. This information would include facts, associations, classes of objects or ideas that are retrievable on demand. Whether a fact is stored as an isolated bit of information, or stored with many rich associations, dramatically influences the retrievability of that information. Storage itself has been used as a measure of intellectual ability. Vocabulary tests are really measures of the semantic storage abilities of the individual. Schools have often placed heavy emphasis on storage in their evaluation of student's success.

A rather different type of mental operation is referred to by the term scanning. Scanning refers to the search skills for relevant material in the storage area to solve a particular problem. It can also refer, in an outward sense, to the style of search taken by the individual in seeking further needed information within the environment. Thus, a person faced with a question, "What is a Heffalump?" and having scanned his internal storage areas and found little response may then direct the attention of the individual in a search for further information from dictionaries, encyclopedias, zoos and children's stories. What has been called divergent thinking in this study seems to represent a set of rules that governs a particular type of scanning done in response to a specific task. In this instance, the tests request that large numbers of possible answers be presented to a given proposition or problem.

There would seem to be a complex relationship between storage and scanning since part of the information placed in the storage units of the human computor must be rules which influence or determine the type of scanning to be done on various kinds of problems. This, in turn, creates a set which will influence future information processing. The influence upon future input of past input has been recognized by such psychological constructs as perceptual defense, perceived dissonance, etc.

The third major area of cognitive operation could be labeled matching. In this operation, the individual is comparing various alternatives in terms of similarity to each other or appropriateness to a given criterion. In the earliest developmental stages, matching seems to refer to simple perceptual identities and differences. Later a different kind of matching seems to relate to whether a particular object or word would belong to a given class or not. Still later, in a developmental sequence it refers to whether a given series of events fits complex criteria of effectiveness. In this respect, matching closely resembles what is called evaluative thinking in the present study. Evaluative thinking can be performed for its own sake; it also can be involved in the problem solving aspect of the fourth major operation.

The fourth major operation would refer to a general system of thinking under the heading of logical operations. In this operation, the individual takes information given to him and is able to apply certain systematic rules to the information in order to generate a solution or conclusion. The development of certain systems of rules in human beings is described effectively in the work of Piaget (Flavell, 1963). Thus, while the type of problem to be dealt with depends upon the scanning operation, the procedure by which the individual generates a conclusion through logical thinking can be termed a logical operation. Convergent thinking would represent the most closely allied major area to logical operations to be used in this present study, although the category of divergent implications and synthesis would also fit into this type of performance. At the present time, the author believes that all of the thinking operations can be included into these four main categories and that they may provide the basis for further analysis of present data.

Cognitive Style

One of the possible links to be forged between the domains of personality and cognition lies in the recent rebirth of interest in cognitive style. Cognitive style may be defined as a characteristic set or way in which an individual responds to, or approaches, his environment. This would include characteristic ways of processing information.

Gallagher (1964b) has pointed out that at least four different investigators have been looking at cognitive style in terms of the willingness of the individual to take intellectual risks. Maslow (1956), Schachtel (1959), Witkin (1962) and Getzels & Jackson (1962) all have investigated and differentiated these styles. Maslow calls them defense and growth; Schachtel refers to autocentric and allocentric; Witkin, et.al. mentions field dependent and field independent; and Getzels & Jackson differentiate High IQ and High Creative. The basis for such styles seems to lie in the personality domain, yet the style reveals itself in cognitive performance.

In the present study, the findings on cognitive style were interesting enough to warrant further investigation. If one may consider classroom expressiveness as a style in itself, some degree of consistency was found between students' measured expressiveness from one point in time to another, and from one classroom to another. This expressiveness also seemed to reveal itself in certain attitudes and personality variables.

In terms of the replication of Getzels & Jackson's work, a number of expected results were obtained, particularly with the High Divergent--Low IQ boys. With this group, teachers were less favorable in their ratings on cognition, as predicted, while the High IQ--Low Divergent boys seemed to be better accepted by the teacher but had some differences in attitudes to various concepts, notably the concept of Work to which they responded negatively.

These results suggest that while Getzels & Jackson and Torrance have been severely taken to task for technical shortcomings in their research, they have put their finger on some cognitive style variables that are most interesting and worthy of further exploration. The general description of the Low IQ--High Divergent youngster seems to hold, at least for the gifted boys in the present study. There are differences in their stated attitudes, and teachers do look at them less favorably than upon the youngster who is called High IQ--Low Divergent.

The implications of these findings for education are something else again. One popular interpretation is that the creative (divergent) student is smothered by the traditional educational setting and is discriminated against by the conformist teacher. Another interpretation, and one which now seems just as likely, is that the 'high divergent but not high IQ' student may, in fact, not be a very successful learner and may be particularly maladept at mobilizing his scattered intellectual resources to attack a particular problem. The teacher then is merely calling them as he sees them when he says that the Low IQ--High Divergent youngster is not as good a thinker since he is not, for most traditional classroom tasks.

Sex differences played a role in the differences obtained in cognitive style. The High IQ--High Divergent girls were found to be significantly superior to the other two categories in classroom expressiveness and in teacher ratings and personality characteristics. The same was not true of the High IQ--High Divergent boys. With these girls, high expressiveness and high attainment in scores on these various instruments accompanied a general pattern of good academic adjustment and acceptance of the academic role.

In the boys, there seemed to be much more confusion and overlapping of roles. Some boys were expressive, apparently for academic gain, while others were expressive to further their own self-enhancement. Obviously, similar behavior of the two sexes may imply vastly different motivational structures and these need more thorough investigation.

Sex Differences

An impressive literature has been developed over the last decade on the importance of sex as a variable influencing many other aspects of behavior. The general results of the present study seem to be in harmony with previous work. The gifted boys seemed to enjoy more self-confidence in their own abilities, while the gifted girls seemed to express more positive attitudes toward other people and towards such socially accepted concepts as Mother, School, Work, etc.

Such differences as observed in this study probably were established some years previous to the present study. As Kagan (1963) pointed out in a recent review:

> "The child as young as four has dichotomized the world into male and female people and is concerned with boy-girl differences. By the time he is seven, he is

> intensely committed to molding his behavior in concordence with cultural standards appropriate to his biological sex and he shows uneasiness, anxiety and even anger when he is in danger of behaving in ways regarded as characteristic of the opposite sex." (p. 162)

There has been an accumulation of evidence showing a variety of applications to this general theme. Torrance (1963) has shown that the amount of ideas produced on a given topic to improve children's toys was dependent on the sex identification of the toy in question. Primary school boys give more ideas on improving a toy if it is seen as masuline and vice versa for the girls.

Crandall and Rabson (1960) found that boys were more likely than girls to return to unsolved puzzles, and to be more analytic, independent and persistent in their approach to problems. Whether or not such differences are genetically or environmentally based, or represent a subtle blend of both influences, is not so important for educational action as the recognition of the presence of such differences.

In the present study, although the girls seemed to be on a par with the boys on written performance, they were much less expressive in the classroom situation. It seems reasonable to conclude that the sex role identification problems of the girls was having an inhibiting effect on their classroom expressiveness. As Kagan pointed out,

> "It is not uncommon for an adolescent to view intense intellectual strivings as a competitively aggressive behavior. In order to obtain the best grade in a class, one must often defeat a peer in open debate and in examination scores. The competition has obvious aggressive overtones. Since the typical

> female has greater anxiety over aggressive and competitive behavior than the male, she experiences greater conflict over intellectual competition." (p. 158)

If such oral expressiveness is viewed as a positive trait for girls, it is clear that special steps will need to be taken to encourage it in the type of environment studied here.

The Measurement of Creativity?

Some of the measuring instruments used in the present study have been labeled creativity tests by other investigators. This is an over-enthusiastic term, to say the least. It is like describing one piston movement in the gasoline engine and saying that one has captured the essence of the entire cycle.

Yet there seems to be little doubt that these tests are measuring something, and that 'something' is different from what is being measured on standard IQ tests. We have suggested earlier that this 'something' was likely a type of cognitive style. Like many other investigators, we found the same small correlation between IQ and divergence, or fluency, or breadth or whatever term may be given to the production of a large number of answers to a given question or proposition. Furthermore, this characteristic seemed reasonably stable within individuals. The best estimate of the staff of this project was that scores on divergent tests, particularly scores which only take into account total production, are really measuring, as one component, intellectual risk-taking.

The role that evaluative thinking plays in the results of such tests needs to be thoroughly investigated. The production of a long string of answers to questions such as, 'What would happen if everyone lived to be 200 years old?' requires a certain suspension of critical judgment. Each answer that is projected could stir up a raft of self-criticism with attendent objections or qualifications. Unless the person is willing to put these aside to go on to the next idea, he will not be productive on a timed task.

If it is true that temporary suspension of critical judgment is one necessary component for creative thinking, then we can see how tests of divergence have a firm grip on one part of the mystical elephant--creativity. The new idea or original proposal tends to wobble and flutter intellectually like a wounded quail and hasn't a chance against academic marksmen whose great joy lie in bringing fledgling ideas down to earth with a sickening thud. Of course, the joke eventually is on these critics since they shoot their own new ideas down with the same ferocity as those proposed by others and are unlikely to produce new contributions of any consequence themselves.

On the other hand, it is unlikely that the compulsive free-association expert, who has dozens of ideas for every problem, but who cannot follow any one of these to conclusion, or bring himself to evaluate which of his many proposals might work in a given situation, will produce much more than the critic who is always evaluating. The divergent tests may very well predict high 'creativity' for such a person and they will be wrong, for the creative person must apply evaluation as well as suspend it, and the failure to do either can be debilitating to actual production. One of the best, but least likely things that could happen would be for investigators to avoid assiduously the term 'creativity' in referring to these embryonic measures.

The Classroom Environment

It has often been said, and said proudly, that teaching is an art. Indeed it is. It might well serve a useful purpose to those of us in the education profession to consider, in more detail, precisely what that statement means. It would seem to mean that we can observe, as a result of the efforts of the best practitioners, an extremely desirable product. Yet we cannot determine the means or process by which this product was obtained.

There is often an accompanying inference that not only has this teaching process not been measured, but that it is incapable of being measured! This viewpoint holds that there is some kind of mysterious magic that creates a fortunate blend of indescribable ingredients that only a few fortunate practitioners have at their disposal. Training in such a situation usually consists of students sitting at the feet of the masters, hoping in some not entirely predictable way, to absorb the magic skill.

This attitude is, of course, not observed only in the education profession. At various times, it has been stated that medicine is an art, psychotherapy is an art, etc. The individual brilliance of some practitioners of such art in the past has not blinded these professions to the necessity of changing from an art to a science as soon as possible. Despite the brilliance of certain individual physicians, good medical service for the bulk of the people has relied on scientific advances in a number of different disciplines.

The situation in education seems highly parallel. If one is blessed with a teacher who has an intuitive knowledge of the process of education, the benefits to his students are manifest. However, what of the other students, most of whom cannot be expected to meet this one-in-a-thousand gifted teacher? Our responsibility would seem to lie in the direction of making education less of an art and more of a science. This will be done by studying the processes by which desirable cognitive products are obtained.

One of the most powerful observations that can be made as a result of the data collected in the present study is how central and crucial is the role played by the teacher as the initiator and determiner of the kinds of thought processes expressed in the classroom. In the classrooms observed, it was the teacher who asked the directing questions, those questions that were the focus of the discussion. The way in which these questions were presented determined the kind of thought operation that the student would be asked to perform.

The tendency of the student to respond in the same idiom as the teacher was so strong that whenever it did not occur, it left the observer with the feeling that either the student did not understand the question or that something was greviously amiss in the implicit rules that governed the teacher-student operation in that classroom. It was hard for a student, for example, to respond to a question such as "Who were the three best presidents the United States has ever had?", without saying something that approached evaluative judgment. It is almost inconceivable to consider a student responding effectively to the question, "What is the formula for nitric acid?" without giving a factual-memory response. The same shaping role played by teacher-questions has been noted by Taba, Levine and Elzey (1964), they commented:

> "The questions teachers ask set the limits within which students can operate and the expectations regarding the level of cognitive operations. Questions are the carriers of whatever new cognitive system is emerging. Some questions function as invitations to heighten the performance of certain cognitive operations, while leaving the content in the direction of these

> operations open. Such questions invite invention, discovery, the creative use of previous knowledge. Others control and limit both the content and nature of cognitive operation."

These observations place both a great responsibility and great opportunity in the hands of the teacher. It means that the teacher can direct the flow and level of thought complexity in the classroom by the manipulation of questions. It is our conclusion that this skill is well within the range and limits of teachers to absorb if given training in the system to be studied, and practice in its application.

There is little doubt in the minds of those investigators who have attempted to study the teacher and the classroom that it is possible to measure the teaching process and to modify and improve it.

Medley (1963) discussing the OSCAR technique (observation schedule and record) made the following statement:

> "Perhaps the most important conclusion to be drawn from these two studies, is that meaningful measures of classroom behavior can be developed from objective records made by relatively untrained observers with a rather crude instrument."

Wallen and Travers (1963) suggested that it is possible to construct a model within which one can construct a law of teacher behavior. Their formula is as follows: $T = f(R_g, R_i)$. T represents the behavior of the teacher which is a function of the goals to be achieved, R_g and the present behavior of the pupils, R_i. On the basis of experience in the present study, the means by which the goals are obtained, as well as the goals themselves, are important topics of study.

Project Limitations

Every research project has built-in limitations which restrict the interpretation of results and circumscribe the number and kind of inferences that can be drawn. In this study, many of the limitations are fairly obvious, but need to be stated explicitly.

Sample of Subjects. One of the factors limiting the results of the study was the type of subjects upon which the data was collected. These students were intellectually gifted with a history of successful academic achievement behind them. Thus, there were no children of average or below average mental ability in the study, nor were there underachievers of an intellectually superior level. This limitation probably influenced the findings that IQ scores was not a significant variable, since the effective IQ range in the study was rather limited. It also might have been responsible for some of the limited relationships obtained between personality and attitudinal variables and classroom performance. One would expect that the great majority of these youngsters were moderately well-adjusted and thus there would be no negative extreme to the distribution along the continuum of emotional disturbance and maladjustment.

Age of Subjects. The sex differences found in the present study may very well be specific to the age level of the youngsters being studied. During the ages of 12 to 16 there emerges a greater consciousness of sex role and this change could well have influenced and biased the results obtained here. It should not be assumed that similar results would be obtained on gifted, intermediate grade children or on senior high school students where these role problems and attitudes may have become more firmly established.

Teacher Sample. Any generalizations in this study regarding teacher behavior are limited by the small number of teachers involved in the present study. It is limited further by the fact that these teachers were specifically chosen to work with gifted students. An unselected group of teachers probably would show greater range and variance on these measured characteristics than the present group. Since the present group already showed very impressive variance on most measurable characteristics, the conclusion drawn is that teachers' performance, when categorized in the manner done in the present study, shows much variation from one teacher to another, although there would be some consistency within the performance of the individual teacher.

Limitations of Classroom Recordings. The recorded sample of teacher and student behavior must be considered only one component to the whole of the learning environment. Not all, nor necessarily the most important, events that occur between teacher and student take place in the discussion-type classroom analysis reported here. Perhaps the best teaching is done in individual conferences with students, or through criticisms and helpful suggestions in development of individual reports, or in the stimulation of personal research projects, etc. While it is tempting to assume that the teacher style in these group discussions would imply certain kinds of behavior in individual contacts this is not necessarily so and would have to be demonstrated.

Measuring Instruments. Every research study is, in the end, at the mercy of the measuring instruments. This project is no exception. One of the key instruments was the Classification System which was devised as part of the total project. The Classification System itself appears to be a potentially useful tool in describing teacher and student behavior, and in categorizing differences between students and between teachers. One of the problems noted early by the judges who were doing the classifications was that the system itself might be too atomistic, or too refined in its ratings, to show accurately what the judges felt was going on in the classroom. Thus, the detailed rating of each statement made by the teacher and the student sometimes detracted from the larger meaning and may, as a consequence, have been somewhat misleading.

One of the consequences of this feeling was that future development of larger units of measurement should be developed that could more adequately describe classroom interchange. This development will be the focus of further research efforts of this investigator.

In addition to the Classification System, the results were dependent upon tests of attitude, such as the semantic differential and sentence completion, and new tests of cognition such as the divergent thinking tests, which are attempting to measure a rather new dimension in intellectual performance. The reliability and stability of each of these measures have been called into question. The risk taken by the investigator was that by using some measuring instruments which appeared to touch upon important variables, even though they had some technical weaknesses, real differences might have been obscured by the unreliability of such instruments.

Future Research Plans

In a program of research, the first study often serves its most important function in making clear what should have been studied, if the investigator only had known at the beginning what he knew halfway through the first research problem. Although much useful information has been generated through this project, there still is the feeling that further analysis along a broader conception of the classroom interaction, with improved measuring instruments, can bring forth much greater returns in terms of insight into teacher strategies and the teaching process.

One of the limitations of the atomistic approach to the topic taken in this first study was that the units being classified and analyzed were very small pieces of classroom behavior. It became obvious, in the process of studying the classroom, that there were larger units that might have more psychological or educational meaning.

Our further investigations have stressed larger units called 'topics', which can be identified, and classified in a broader system. We are hopeful that further analysis of this type of classroom unit would provide even more meaningful information in terms of teacher education and teacher training.

Not all teacher or student behaviors are equally important to the conduct of the classroom or to the advancement of curriculum goals. There appear to be certain critical incidents, certain choice points, certain cross-roads, that appear from time to time in the sequence of the classroom activities. The decisions taken at these points seem to have a shaping or molding effect on the entire classroom operation. An attempt to locate such choice points is one of the logical extensions of the present study. Informal content analyses of the various tapescripts used in the present study have already been undertaken with these points in mind. It is hoped that a classification of these various choice points will fit them into the larger topics or strategies in classroom operation.

Another categorization which may pay richer dividends in teacher training and education is to discover the range of possible teacher choices in a given situation and to attempt to explore the consequences of each of the choices. At first, this would be done clinically by taking specific examples from different tapescripts.

Smith (1963) differentiates tactical moves and teacher strategies in a way that is descriptive of our current thinking. He states,

> "While tactical moves are the means by which the subject matter of instruction is manipulated and controlled from moment to moment, strategies consist of ways by which the materials of instruction are deployed for the purposes of either constructing or releasing the behavior of the students." (page 297)

Although the results within the classroom were only suggestive in the present study, there were some hints that certain kinds of cognitive processes are more called for in certain subject areas than in others. In science, the emphasis seemed to be on the close analysis of specific problems. Little attempt was made to explore a large number of different intellectual paths; instead, emphasis seemed to be placed on the analytic efficiency by which one followed one line of thought. Thid does seem to call for a different type of teacher strategy, or a review of teacher strategy, if indeed, other cognitive goals are considered to be important. The scientific technician must be able to follow standard procedures, but the creative scientist must explore. A close analysis of a random sample or typical sample of effective teachers in a given content area would provide a general picture of current expectations in cognitive expression in various subject areas.

The sex differences in the present study underline the importance of understanding the attitudes, values and perceived sex roles of students in order to provide an effective educational environment for them. The results in this study were sufficiently dramatic to suggest that a major research effort should be made on the study of gifted girls. One line of investigation could take the comparison of public vs. private performance on intellectual tasks. It seems fairly obvious that intellectual aggressiveness is generally accepted as a male role. Girls who are able to compete in this area appear, on the basis of our present findings, to be the most mature, secure and well-adjusted girls. Does the inhibition on intellectual aggressiveness in public performance influence the private performance aspect of the educational program as reflected in term papers, individual research projects or compositions, or in other dimensions which guarantees a certain amount of social anonymity for the student?

A further study of attitudes and values of gifted girls would lead to a better understanding of their various role problems in modern society. Since gifted girls represent the largest single source of untapped intellectual potential for our society, it would seem important to devote more attention to their description and analysis of their unique adjustment problems at all levels of the educational system.

MacKinnon (1962) and others have pointed out the seemingly paradoxical finding that creative members of both sexes appear to approach the other sex in personality characteristics and attitudes. That is, creative men appear more feminine; while creative women appear more masculine. It seems likely that such findings may relate to the general characteristics of openness to experience as opposed to a closed system where certain experiences and thoughts are denied access to the individual on the grounds that they are inconsistent with the self-image or concept.

This leads into the topic of cognitive style, or styles of information processing and the impressive degree of individual difference in such styles. What family and social variables are relevant for creation of various styles? What roles do different types of instruction have upon the growth or delay of these styles?

One of the most stringent set of limitations is perceived sex role. One can note the contempt society holds for men who engage in the fine arts or the suspicion held for women who invade the physical sciences. Predominantly other-directed individuals likely shut themselves off from experiences that they identify as belonging to the opposite sex and thus reduce the amount of effective concepts they can bring to bear in a problem solving or creative thinking situation. The precise patterns of child rearing practices and later social experiences which result in the other-directed vs. inner-directed adults could likely provide the basis for greater creativity from the individual and the culture.

Despite the emphasis in the current study on interaction and complex social variables, there should be recognition of the role that the laboratory should play in studying some aspects of the problems noted here. A prime example would be the study of the thinking operation or the thinking process itself. It is unlikely that too much will be derived from extended types of analysis of student responses to questions such as 'How many ways are there to use a brick?' or 'What would happen if pills were substituted for food?' Too much of importance has taken place between the question and answer within the mind of the respondent that goes unstudied. Intensive analysis of the chain of thinking that gets the person from question to answer would be more to the point and individual study in a controlled situation would be more likely to reveal insights of importance.

Some of the new techniques of computer simulation of thinking operations may be necessary to find our more about such processes as 'insight.'

If insight represents a generalization about certain data, perhaps there is a critical mass, say 70% of necessary data dealing with the problem must be available to conscious manipulation, before the insight comes????? Such studies are more open to computer study than study of human subjects since one can control amount and kind of prior input to the computer.

A final word. Many social scientists who have received training in experimental and research techniques yearn to have a neat and precise type of problem where a specific treatment is applied, appropriate control groups are available, all extraneous factors are either eliminated or controlled, etc. Even the thought of studying the multitude of interacting factors in the classroom must bring a feeling of despair. If the results are dependent on the teacher, the phase of curriculum development, the personality and intellectual makeup of the group, numerous child developmental variables, the time of the year they are observed, etc., how meaningful is the talk about controlled experimentation?

Perhaps the closest approach to the problem would be to use one group as its own control and systematically introduce teacher variation such as different types of question-asking behavior, to see what influence this might have. While this would use the class and teacher as its own control, even such a simple move is at the mercy of a number of the above variables, to say nothing about the generalizability of the findings.

Perhaps, at this point in time, the model for the social scientist (whose object of study is group interactions in complex social situations) should be closer to the astronomer than to the physicist. The astronomer is doomed to observe the universe and draw inferences from those observations without being able to control or manipulate the variables at his pleasure.

The physicst has much more control and manipulation opportunities and is not burdened with such matters as the representativeness of the sample of matter he is experimenting with.

The rationale for studying the classroom does not rest in possibilities for elegant research design, rather it is because these are important matters influencing present and future generations. Each scientific area must, in the end, work out its own destiny, its own methods, its own theoretical models without too thorough an imitation of older and more mature disciplines. We can hope that the social sciences can have the same openness to experience in methodology and theory that it yearns for in the gifted students that were included in the present study.

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THE FAMILIES OF GIFTED CHILDREN[1]

By

William C. Jenné

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[1] After two years experience with the project it became obvious that one important aspect of the gifted child's environment that could have important consequences for classroom behavior was not being examined--the family. Through a supplementary grant to the original proposal obtained from the Cooperative Research Branch of the U. S. Office of Education it was possible to add a research sociologist, Dr. William C. Jenné, to the project staff.

Dr. Jenné designed a research study that could provide more information on this aspect of the project. In a real sense this is a study within a study. Dr. Jenné devised the instruments, provided the rationale, and carried out the separate analyses required. It is for this reason that this section is presented as a self-contained unit in terms of procedure and results.

INTRODUCTION

The basic purpose of the study of the families of the gifted youngsters was to attempt to gain insights into the relationships between family environment and the child's performance in the classroom and his performance on paper and pencil tests of divergent thinking ability.

The family study began with a review of the literature relating to "creativity" and divergent thinking. Particular emphasis was placed upon determining what was known about traits and characteristics associated with creativity. Only with such knowledge could intelligent decisions be made regarding those aspects of family environment which were most crucial in terms of influence upon cognitive abilities and particularly upon divergent thinking ability. Accordingly, the work of Barron (1955), Drevdahl (1956), Getzels and Jackson (1961) and (1962), Guilford (1962), Mackinnon (1962), Reid, King and Wickwire (1959), Roe (1951), Rogers (1959), Schachtel (1959), and Torrance (1960), among others, was reviewed for data and concepts which might bear upon the relation between family environment and cognitive style. In addition, since the concept of achievement seemed to bear upon the investigation, the work of Crandall, Katkovsky and Preston (1960); Crandall, Preston and Rabson (1960), Davis (1949), Drews and Teahan (1957), Lewis (1941), McClelland (1958a, 1958b), Rosen (1958), Torgoff and Dreyer (1961) and Winterbottom (1958), among others, was reviewed for findings, concepts and methodology which would have relevance to the study. In addition, the author drew upon his own background as a sociologist with some experience in family research.

Unfortunately, the review of the literature offered few solid clues as to the best course for our own investigation. The welter of different concepts, different operations used in defining concepts, different methods of data gathering and different populations sampled made it difficult, if not impossible, to derive a solid conceptual framework. However, a tentative framework was drawn up to provide some basis for getting the study under way.

The framework consisted of the following assumptions:

1. It was assumed that cognitive styles are learned; i.e., that styles of thinking arise as a result of the process of socialization of the child.

2. It was assumed that parental socialization of the child was a potent factor in determining the cognitive style of the youngster.

3. It was assumed that not only socialization practices directly related to cognitive style but also practices related to propensity for risk-taking, development of independence and development of flexibility in thought and action would be influential determinants of cognitive style in the young adolescent.

4. It was assumed that parents attempt to socialize their children so as to replace themselves; i.e., that parents try to reproduce their own norms and values in their children.

5. It was assumed that socialization would be effective (from the parents' standpoint) only if parental expectations regarding the child's behavior were accurately communicated to the child.

6. Finally, it was assumed that not only were specific socialization practices influential determinants of the child's behavior but also that the place of the family in the community and the general atmosphere in the home were influential determinants of the child's behavior.

Assumptions 1 and 2 were necessary to justify the study. If cognitive abilities are not learned or even if they are learned if parental socialization has no influence upon the learning, then there is little point to the study. The third assumption dictated broadening of the investigation to include a wide variety of socialization practices which might relate to certain non-aptitude traits and characteristics which, in turn, might relate to cognitive style. The fourth assumption indicated that sampling of parental values and norms with respect to socialization of children was necessary. The fifth assumption suggested that some measure of accuracy of parent-child communication was in order. The sixth assumption dictated that such factors as socioeconomic status of the family, education of parents, religion, marital integration of parents and amount of tension and anxiety present among family members be taken into account in the study.

The basic assumptions underlying the study, then, directed that the following aspects of the family and family life be investigated:

1. Social organization aspects -- the community setting. Socioeconomic status of the family (father's occupation), amount of education attained by both parents, religious preference of the parents -- variables which help to indicate the place of the family in the economic and prestige structure of the community.

2. Demographic-ecological aspects of the family: The size of the family, age of parents, number of years parents had been married, age of parents at marriage -- variables which help to characterize the family in terms of its stability and its complexity as a group.

3. Social Psychological aspects:

a. Father-Mother interaction and agreement on norms and values used to guide family life and socialization of children. Degree of parental agreement on domestic values, agreement with respect to aims of socialization of children, degree of congeniality in husband-wife relationship.

b. Parent-Child interaction and communication: Degree of congeniality (absence of tension) in parent-child relations, degree of parental satisfaction with child's behavior, child's perception of parental satisfaction with his behavior, degree of accuracy of parent-child communication.

In addition to the above factors to be included in the study, it was decided to gather data on maternal employment, number of jobs held by the father and parental involvement with the school that the child was attending.

Preliminary work on the study made it clear that the investigation would have to be exploratory in nature; i.e., in the absence of a well-structured conceptual framework it would not be possible to derive specific hypotheses to be tested. Rather, the aim of the study is to develop hypotheses which might then be tested in a future study.

In the next section the sample of families used in this study is described. Then, the general procedures used in the investigation are described. In the discussion of specific instruments and techniques used in the study specific mention is made of indebtedness to the various authors whose work was cited earlier as having been reviewed. Finally, in the last section, the results of the study are described and interpreted.

THE SAMPLE

The target population for the family study included all families with children who were taking part in the study of productive thinking in the classroom.

Tape-recorded data on classroom performance in the two schools involved in the study were available for 170 children. The 170 children represented

167 nuclear families (3 families contributed 2 children each to the study). Of the 167 families, 20 were not available for questioning at the time that the family study was undertaken. Thus, 147 families with children who took part in the study of classroom performance were available for questioning. All of these families were contacted by letter and asked to take part in the study.

An additional 31 families with a child attending one of the schools involved in the study but for whom no classroom performance data were available were also contacted and asked to participate. Thus, a total of 178 families were contacted.

Socio-economic Characteristics of the Sample

Table 31 gives some of the socio-economic characteristics of the 117 families who provided information sufficient to justify being included in a factor analysis. Inasmuch as most analyses of the data are performed for boys and girls separately, family characteristics are given separately for families who contributed boys to the study and families who contributed girls to the study.

Inspection of Table 31 reveals only minor differences when families contributing boys are compared with families contributing girls. Data given in Table 31 show that in general, the parents in the sample were in their early to middle forties, had an average of three children, had been married about 18 years, were married and living together at the time of the study and were predominantly Protestant. Although no data on race appear in Table 31, all families with a boy in the study are Caucasian. One family with a girl in the study is Negro; the remainder of the families are Caucasian.

Table 31

Attributes of Members of Families Included in the Study

Attribute and Categories	Summary Description	
	Families With Boy in Study	Families With Girl in Study
1. Number of families	61	56
2. Mean age of child in study	13.5 years	13.9 years
3. Mean age of parents		
Fathers	44.7 years	44.7 years
Mothers	42.3 years	41.5 years
4. Mean number of children in family	2.8	3.0
5. Mean number of years parents married	17.3 years	18.6 years
6. Mean age of parents at time of marriage		
Fathers	26.9 years	25.6 years
Mothers	24.5 years	22.4 years
7. Percentage of parents of child in study married and living together at time of study	98.4%	100.0%
8. Median years of education completed by parents		
Fathers	18.1 years	18.2 years
Mothers	16.2 years	16.0 years
9. Percentage of Father-Mother combinations on religion		
Both Protestant	57%	55%
Both Catholic	7%	4%
Both Jewish	5%	5%
Other religion, both parents agree	8%	16%
Preference both parents unknown	2%	2%
Protestant-Catholic combination	5%	9%
Protestant-Jewish combination	2%	2%
All other combinations	12%	4%
Preference one parent unknown	3%	4%
10. Percentage of fathers: Occupational classification		
Professional, Technical, and Kindred workers	72%	79%
Managers, Officials, and Proprietors	10%	2%
Clerical and Kindred workers	2%	4%
Sales workers	2%	4%
Craftsmen, Foremen, and kindred workers	8%	4%
Operatives and kindred workers	2%	4%
Service workers (except private household)	2%	5%
Retired	3%	--

Data shown in Table 31 relating to years of education completed by parents and fathers' occupation indicate a distinct educational-occupational bias in the total sample of 117 families. The medians of approximately 18 years of education for fathers and 16 years for mothers can be compared to 1960 census data for the general population. According to Gendell and Zetterberg (1964), for white males ages 40-44, 1960 census data give a median of 12 years of education; for white females of ages 40-44, a median of 12.1 years of school completed. Thus, in relation to the U. S. population, the sample of parents included in the study is, to say the least, highly educated. The extent of the bias toward the upper reaches of the educational distribution can be further illustrated by noting that 82 of the 117 fathers reported completion of more than 4 years of college.

The unusually high level of formal education attained by the parents can be explained in part by the presence of a large university which is the principle industry in the community. Of the total of 88 fathers in the sample characterized as professional, technical and kindred workers, 55 were university teachers. In addition, 9 fathers were either physicians or dentists.

No data are available as to yearly income of the families in the sample. The circumstances under which the research was conducted dictated caution in attempting to secure this kind of information.

It is obvious that the educational-occupational bias of the sample limits generalization of findings. Inferences made regarding the relationship between family environment and cognitive style displayed in the classroom, and all other relationships explored in this study, are limited to samples of families which possess the socio-economic, residential and educational characteristics presented here.

PROCEDURE

In this section (a) procedures used in gathering data, (b) instruments and classifications used in analysis of the data and (c) techniques of analysis are described.

GATHERING THE DATA

Early in the study, the decision was made to gather the data by means of a mailed questionnaire. The decision was dictated by practical circumstances rather than theoretical or methodological considerations.

Pretesting the questionnaire

A preliminary form of the questionnaire was assembled and submitted to colleagues of the writer. Included with each questionnaire was a two-page instruction sheet giving the purpose of the study, the kinds of data to be elicited by the questionnaire, general instructions on filling out the questionnaire and a list of specific points to be kept in mind in criticizing the questionnaire (e.g., relevance of data elicited to the research problem, clarity of directions, ambiguity in wording of questions, etc.)

A total of fifteen persons, 8 females and 7 males, took part in the pretest, including some married couples. All had college training and most had considerable experience as professional educators on the college level. All pretest subjects were "sophisticated" not only in their ability to follow complicated directions but also in their ability to apprehend ambiguity and lack of clarity. On the basis of their comments, ambiguities were eliminated, directions clarified, questions eliminated or reworded and an estimate of the length of time needed to complete the questionnaire gained.

Contacting the Respondents

To insure maximum cooperation, the parents were first approached through the school that their child was attending at the time of the study. Initial contact was in the form of a letter signed by the school principal. The letter identified the research organization and the funding agency, briefly explained the nature of the study, guaranteed that only the research staff would know the identity of the respondent, and alerted the parents to expect a questionnaire in the mail.

The questionnaires were mailed to the parents in early May, 1962, two days after the letters from the school principal had been mailed. A cover letter signed by the director of the research project accompanied the questionnaire. The letter included a short explanation of the project, a request that each parent fill out the questionnnaire independently, a further guarantee that no family would ever be identified, and brief instructions on completion and return of the questionnaire. A stamped, self-addressed envelope was included for return of the completed forms.

Questionnaires were sent to both parents in each family, except in those few instances in which it was known that one parent was deceased or where divorce or separation had occured. To help promote parental independence in responding, questionnaires were sent to each individual parent under separate cover. In addition, fathers' questionnaires were mimeographed on white paper while green paper was used for mothers' questionnaires.

Questionnaire Format

Inasmuch as the focus of the study was on a particular child in each family, blank spaces were left at strategic points in the questionnaire where the first name of the child was written in in ink before the forms were stuffed and mailed. This measure helped to insure that parental responses would focus upon the child of interest and, incidentally, helped to "personalize" the questionnaire.

Identification numbers were stamped on the back of the questionnaire. Parents were informed in the cover letter of the presence of and the purpose for the ID numbers.

Copies of the final form of the questionnaire which was sent to the parents appear in appendix G.

Response to the Questionnaire

Questionnaires were sent to a total of 178 families. Table 32 gives data relating to response to the questionnaire. "Complete" or "maximum" response was secured from 79 per cent of the families contacted (141 complete returns out of 178 contacted). If per cent return is computed for sex of parent, we find that 87 per cent of the mothers contacted returned completed forms (153 mothers out of 175 mothers contacted) while about 80 per cent of the fathers contacted returned completed forms (136 fathers out of 171 fathers contacted).

If a parent returned partially completed forms and where the evidence suggested that parts had simply been overlooked or directions not understood, then separate pages containing the incomplete parts were mailed to the respondent with further directions for completion. If a parent refused to complete part of the questionnaire no attempt was made to secure the missing information.

If neither parent returned the forms within two weeks of the initial mailing, the investigator telephoned to ask if the forms had been received. In some instances, two or three calls were made to the same family.
A final appeal was made in the form of a personal note to each parent who had not returned the forms six weeks after the initial mailing.

Table 32

Response to Mailed Questionnaire

Response Category	Number of Families	
Total families contacted		178
Complete response		
Both parents returned completed forms	131	
Widows who returned completed forms	6	
Widowers who returned completed forms	2	
Parents divorced, mother returned completed forms	1	
Parents divorced, father returned completed forms	1	
Total complete responses		141
Incomplete responses*		
Mother returned completed forms, father did not (not widowed, divorced or separated)	13	
Father returned completed forms, mother did not (not widowed, divorced or separated)	2	
Both parents returned forms, father's forms not complete	2	
Total incomplete responses		17
No response		
Both parents failed to return forms, reason unknown*	15	
Both parents refused to complete forms	5	
Total no response		20
GRAND TOTAL		178

*In most instances, the stated reason for failure to return forms was that parent was "too busy." In a few instances, a parent would refuse to complete certain parts of the questionnaire.

Data Gathered from the Children in the Study

One area of concern in the investigation of family environment was that of degree of accuracy of parent-child communication. In order to obtain an estimate of accuracy of parent-child communication it was necessary to have the children respond to one of the instruments to which the parents had responded. The parents had responded to a list of 22 items representing a variety of activities in which young adolescents normally engage. For each activity, the parents indicated whether they were satisfied or dissatisfied with the child's performance of the activity. The children, in turn, were presented with the same list of activities and, for each activity, were asked to indicate whether they thought their parent was satisfied or dissatisfied with their performance. Each child was given two identical lists of items; for one he responded in terms of his perception of father's satisfaction and for the other in terms of perception of mother's satisfaction.

To forestall collusion and to promote independence of response the children filled out the instrument while at school. The great majority of the children completed the form while in a group in a classroom setting under the guidance of the investigator. The data from the children were gathered in late May and early June, 1962. A copy of the instrument appears in appendix F.

INSTRUMENTS AND CLASSIFICATIONS USED IN ANALYSIS: INDEPENDENT VARIABLES

The instruments and classifications used to describe the independent variables used in this study are as follows:

1. Indices of parent-child communication and parental satisfaction and child's perception of parental satisfaction with his behavior.

2. Index of degree of parental emphasis upon child behaviors which purportedly relate to divergent production.
3. Index of father-mother agreement on behavior choices which purportedly relate to divergent production.
4. Index of father-mother agreement on long-term aims of socialization.
5. Index of parental emphasis upon independence-granting in child-training.
6. Index of degree of integration in the marriage.
7. Component scores from Marital Integration Index.
8. Indices of degree of tension in system of family roles.
9. Classification of families as to type of family organization.
10. Demographic-ecological variables relating to the family.
11. Index of socioeconomic status of the family.
12. Indices relating to gainful employment of father and mother.
13. Indices of parental involvement with school child was attending.

Indices of Parent-Child Communication, Parental Satisfaction and Child's Perception of Parental Satisfaction with his Behavior

Indices of parent-child communication and satisfaction with the child's behavior were derived from responses of parents and children to questions about parental satisfaction with the child's performance of 22 activities in which young adolescents normally engage.

The list of 22 activities was taken from a list of 50 activities developed in other studies. The original list is fully described by Farber and Jenne (1963). The reduction in the number of items for this study was necessitated by the structure of the questionnaire which was mailed to the parents. However, the 22 items were not randomly selected from the original list of 50 items. Rather, the items were selected on the basis of evidence that they represented two distinct kinds of activity: (a) instrumental activity and (b) social-emotional activity. Definitions of these two kinds of activity are given in discussion of specific indices.

In the child's form, the lead question to the list of 22 activities was as follows:

> If your mother could change the following things about you, which of them do you think she would like to have you do more often, less--and which do you think she would like you to do as you do now?

The same question was also asked (on a separate page) with "father" substituted for "mother." The child checked: much less, a little less, as I do now, a little more or much more. On the parents' schedule, appropriate changes were made in the wording of the questions. The list of activities appears in appendix G.

The responses were coded to distinguish between those which indicated satisfaction and those which indicated dissatisfaction. Following is a listing of responses which were regarded as indicating satisfaction or dissatisfaction or which were regarded as invalid responses:

1. Response regarded as indicative of satisfaction: "As I do (he, she, does) now".
2. Responses regarded as indicative of dissatisfaction: (a) "Much less", (b) "A little less", (c) "Much more", (d) "A little more".
3. No response and invalid responses: (a) Failure to indicate response for item; (b) more than one response to item and where responses are in conflict, i.e., one response indicates satisfaction but the other response indicates dissatisfaction.

The following indices were developed on the basis of responses to the activities list:

1. Scale of parental satisfaction with child's internalization of norms related to instrumental behavior (completed by parents and children).
2. Index of parental satisfaction with child's internalization of norms relating to social-emotional behavior (completed by parents and child).
3. Index of effectiveness of parent-child communication.
4. Index of level of parental dissatisfaction with child's behavior.
5. Index of level of parental dissatisfaction as perceived by the child.

Scale of Parental Satisfaction with Instrumental Behavior

The scale of parental satisfaction with the child's internalization of norms relating to instrumental behavior was used to measure both parents' satisfaction with the degree to which the child had internalized norms and the child's perception of his parents' satisfaction.

In this study, the definition of what constitutes instrumental activity is the definition developed by Farber and which was reported in Farber and Jenne (1963). Following is Farber's definition of instrumental activities as they relate to the nuclear family:

> Instrumental activities...are characterized by the accomplishment of specific tasks which tend to promote the welfare of family members in relation to the physical and extra-family social environment. At a minimum, instrumental tasks related to family life involve a general conformity to conventional norms of the community.... Secondly, instrumental activities, to be worth accomplishing, must be regarded as "serious" if not sacred. A child's propensity to perform instrumental tasks related to family welfare refers to (a) his conformity to conventional behavior (e.g., go to church, not stay out late at night), (b) his definition of the world as "serious" (e.g., stick up for individuals' rights, worry about what goes on in the world), (c) his general propensity toward task performance (e.g., take advice, try to be successful, finish what he starts), and (d) his consistent performance of specific tasks related to welfare of family members (e.g., help at home, excel in school work).

Parental satisfaction with the child's conformity to norms relating to instrumental behavior and child's perception of parental satisfaction was scaled along a dimension of external constraint vs. internalization of norms. Degree of satisfaction with the child's internalization of norms was indicated by subconcepts which were placed along a continuum. At one extreme, the concepts refer to conduct to which the child may conform only because of external constraints (conventional behavior). At the other extreme, the concepts refer to conduct reflecting a high degree of internalization (performance of specific tasks). Of course, the dimension is not the actual degree of internalization but the parents' estimate of the extent to which the child has attained internalization of norms to the degree expected by that parent. From the standpoint of the child, it is his estimate of the extent to which he is conforming to the parents' expectations regarding internalization of norms. The concepts which were regarded as reflecting a dimension of external constraint vs. internalization of norms relating to instrumental behavior are shown in Table 33.

The scale of parental satisfaction (or dissatisfaction) with instrumental behavior was developed by Farber and has been employed in other investigations.

According to criteria given by Stouffer, Guttman, et al. (1960), this scale is considered unidimensional in that its content implies a continuum and the rank ordering of the respondents is related to the pattern of their responses on the scale. The unidimensionality of the scale was demonstrated empirically through the use of a modification of the Guttman scaling technique as developed by B. F. Green (1956). Table 34 gives the reproducibility coefficients derived from the responses given by all parents

Table 33

Scale of Satisfaction with Instrumental Behavior[a]

Contrived Items[b]	Subitems on Interview Form
a. Conformity to conventional behavior	Go to church or Sunday school Stay out late at night Go along with fads; for example, Rock and Roll, hot rods, etc.
b. Definition of his "world" as serious	Stand up for myself[c] Stick up for other people's rights[c] Worry about what goes on in the world Take things seriously
c. Propensity toward task performance	Take advice from older people[c] Listen to my teachers[c] Try to be successful Try to finish what I start
d. Performance of specific tasks	Think about school work Help around the house Keep own room neat

[a] Responses indicating satisfaction were given a plus sign; those indicating dissatisfaction were given a minus sign. The contrived item was given a score of 1 when at least two of the subitems received a plus and a score of 0 when two or three of the subitems received a minus. Scores for the contrived items were summed to give a total scale score ranging from 0 to 4.

[b] Failure to respond to a subitem or assignment of conflicting responses was scored as "dissatisfaction." If the score for more than one contrived item was determined by failure to respond or conflicting responses then no total scale score was computed.

[c] These alternative subitems were regarded as single items. If one or both items received a plus, the subitem was given a plus. If both items received a minus the subitem was given a minus.

4

Table 34

Reproducibility Coefficients for Scale of Satisfaction with Instrumental Behavior

	BOYS		GIRLS	
	N	Reproducibility Coefficient	N	Reproducibility Coefficient
Father's satisfaction with child's behavior	79	.94	68	.94
Mother's satisfaction with child's behavior	81	.94	76	.95
Child's perception of father's satisfaction	83	.94	69	.92
Child's perception of mother's satisfaction	82	.95	73	.96

and children in this study who provided usable data. In general, a reproducibility coefficient indicates the degree of accuracy with which one could "reproduce" the pattern of responses to items in a scale if all that were known were the total scale score. Thus, a coefficient of .95 indicates that 95 per cent of the time you could correctly reproduce actual patterns of responses to items in the scale knowing only the total scale score. For a scale to be considered "unidimensional" a coefficient of .90 or more is needed.

Parental Satisfaction with Social-Emotional Behavior: Factor Scores

In the course of another investigation, three sociologists selected a list of items which they judged to be related to social-emotional behavior from the total list of 50 items referred to earlier in this section. The responses to the list of items of 110 children of ages 10-16 inclusive were factor analyzed; separate analyses being performed for children's responses with reference to father and responses with reference to mother. On the basis of the results of the factor analyses, eight items were selected as representing the social-emotional dimension for both parental satisfaction with the child's behavior and child's perception of parental satisfaction. A complete description of the methods used in selecting the items to represent the social-emotional dimension is given in Farber and Jenne (1963).

In this study, the definition of what constitutes social-emotional activity in the American middle-class family is the definition developed by Farber and reported in Farber and Jenne (1963). Following is Farber's definition of social-emotional activities as they relate to the nuclear family:

> Social-emotional activities...are characterized by the establishment and reaffirmation of the relationships which bind the family members together. As primarily integrating activities, social-emotional activities are directed toward other family members rather than toward the physical and social environment of the family. Social-emotional activities are characterized by acts of friendliness and trust, sympathy and affection. A child's propensity to perform social-emotional activities in the family then refers to (a) his tendency to perform social-emotional acts (e.g., be friendly and trust people, feel sorry for those in trouble) and (b) his propensity to perform social-emotional acts specifically with respect to other family members (e.g., show affection toward parents).

Table 35 gives the items selected to represent the social-emotional factors, the method used in calculating factor scores, and the range of scores.

Index of Effectiveness of Parent-Child Communication

The measure of effectiveness of parent-child communication was obtained by cross-tabulating the responses of each parent to the entire list of 22 items in the activities checklist against the responses given by the child for whom the parent completed the instrument. Thus, two tables were generated for each family which provided complete data: (a) a table containing a cross-tabulation of the father's responses for a specific child against that child's responses regarding his perception of his father's satisfaction with his behavior and (b) a table containing a cross-tabulation of the mother's responses for the same child for which the father responded and that child's responses regarding his perception of his mother's satisfaction with his behavior.

Following are definitions of the terms used in the formula for the index of effectiveness of parent-child communication:

A = Number of items for which father (mother) indicates satisfaction AND for which the child perceives father (mother) as being satisfied.

Table 35

Satisfaction with Social-Emotional Behavior: Factor Scores[a]

Items Representing Factor	Weight[b]
3. Show affection toward father	2
6. Show affection toward mother	3
9. Be friendly to people	3
12. Feel sorry for those in trouble	1
15. Show feelings toward friends	2
18. Trust people	1
20. Be happy to see company come	1
22. Show care in picking out friends	1

[a] Factor scores were calculated as follows: If the response to an item indicated satisfaction then that item was given its designated weight. If the response showed dissatisfaction, the item was given a weight of 0. The weights of the 8 items were summed to produce the factor score. Scores ranged from 0 to 14.

[b] The weights assigned to the items representing the factor were determined in the following way: Weight of 3 = factor loading of .6 or more on two separate analyses; weight of 2 = loading of .6 in one analysis and loading of .5 to .4 in second analysis; weight of 1 = factor loadings of less than .6 in both analyses. A complete description of the original factor analyses is given in Farber and Jenne (1963).

B = Number of items for which father (mother) indicates dissatisfaction AND for which the child perceives father (mother) as being dissatisfied.

X = Number of items for which either parent or child or both failed to give a response or gave conflicting responses.

N = 22 (total number of items)

Index of effectiveness of parent-child communication = $(A + B)/(N - X)$.

Thus, the index of effectiveness of parent-child communication is the ratio of the number of items for which the parent indicates satisfaction and the child perceives satisfaction plus the number of items for which the parent indicates dissatisfaction and the child perceives dissatisfaction to the total number of items to which an acceptable response was assigned. Theoretically, the numerical values of scores can range from .00 to 1.00.

Index of Level of Parental Dissatisfaction with Child's Behavior

The index of level of parents' dissatisfaction with the child's behavior is the ratio of the number of items in the 22 item activities list for which the parent indicates dissatisfaction to the total number of items to which an acceptable response was assigned. Theoretically, the numerical values of the scores can range from .00 to 1.00. The higher the value of the score the higher the level of parental dissatisfaction.

Index of Level of Parental Dissatisfaction as Perceived by the Child

The index of level of parents' dissatisfaction as perceived by the child is identical to the index of level of parental dissatisfaction both in form and in range of theoretical values.

Index of Emphasis upon Child Behaviors Related to Divergent Production

The behavior choices instrument was developed especially for this study in order to provide an index of degree of parental emphasis upon attitudes and behaviors purportedly related to divergent production and intellectual autonomy. A copy of the instrument as it appeared in the questionnaire is given in Appendix G.

The items which make up the instrument were derived from literature on "creativity." The works of Getzels and Jackson (1961, 1962), Schachtel (1959), MacKinnon (1962), Guilford (1962), Barron (1955), Reid, King and Wickwire (1959), Rogers (1959), were among those which served as sources for the items. The items were selected so as to meet two essential criteria: (a) the items must, with at least face validity, relate to development of intellectual autonomy in young adolescents and (b) the items must represent a broad spectrum of attitudes and behaviors.

The instrument is composed of five paris of items. One item in each pair putatively relates to development of intellectual autonomy while the other item represents the other side of the coin--intellectual dependence.

In Table 36 the items which make up the behavior choices instrument are presented and classified according to behavioral area tapped and relation to autonomy or dependence.

The last pair of items, those pertaining to choice of friends, were derived directly from the work of Getzels and Jackson (1961). Getzels and Jackson reported that mothers of "creative" adolescents tended to stress character and personality traits as criteria for choice of their children's friends. Mothers of "high IQ-low creative" adolescents, on the other hand, tended to stress social position, dress, and manners as criteria for choice of friends.

Appropriate changes were made in wording of the items to conform to sex of the child of interest. The items were scrambled and presented to

Table 36

Items in Behavior Choices Instrument

Behavioral Area	Item Related to Autonomy	Item Related to Dependence
Direction of Emphasis in Intellectual Effort	Learn to use his imagination in developing new approaches to problems	Strive to attain a solid fund of exact knowledge
Allocation of Time	Learn to do the things that he enjoys doing	Learn to do the things that will help him get ahead later in life
Consciousness of Self in Relation to Others	Learn not to be too concerned about the impression that he makes on others	Learn to be careful about the impression that he makes on others
Basis for making decisions	Learn to trust his own judgment	Learn to consider the opinions of others
Basis for Choosing Friends	(Internal criteria) Choose friends who have a sense of humor and a mature outlook on life	(External criteria) Choose friends who are neat, well-mannered and who come from good backgrounds

the parent as a single instrument. The parent was asked to rank the entire list of items in order or preference--with the first choice ranked 1 and the last choice ranked 10.

The index of parental emphasis upon development of intellectual autonomy is expressed as a Spearman rank correlation coefficient. The rank correlation coefficients were computed in the following manner:

1. An "ideal" rank-order was established such that when correlated with the actual rank orders given by the parents the maximum positive value would occur only when the parent had assigned ranks 1 to 5 to items putatively related to intellectual autonomy and ranks 6-10 to the remaining items. The "ideal" rank order was constructed by simply assigning the mean of ranks 1-5 to each "autonomy" item; i.e., a mean rank of 3; and by assigning the mean of ranks 6-10 to each "dependence" item; i.e., a mean rank of 8.

2. Spearman rank correlation coefficients were computed for each parents' actual rank order versus the "ideal" rank order. The higher the value of the coefficient the greater the parental emphasis upon those characteristics purportedly related to intellectual autonomy.

In addition to the index of parental emphasis upon intellectual autonomy, the behavior choices instrument was also used to measure parental agreement on socialization practices. For each family, a Spearman rank correlation coefficient was computed as a measure of father-mother agreement on actual rank orders assigned to the behavior choices.

There is no direct evidence available regarding validity and reliability of the behavior choices instrument. However, the items were constructed on the basis of previous research findings.

Index of Parental Agreement on Long-Term Aims of Socialization

The life goals instrument has been developed by Jenne (1964). The instrument was used in this study in order to provide an index of parental agreement on long-term aims of socialization for a specific child. A copy of the life goals instrument as it was presented to the parents appears in Appendix G.

In the life goals instrument, parents are asked to give some indication of the kind of adult they hope the child will become. The parents are asked to rank 10 goals in order of importance as they hope the child would rank them. A Spearman rank correlation coefficient was computed as a measure of mother-father agreement in rank-order assigned to the ten life goals.

Jenne (1964) has presented evidence related to test-retest reliability of the life goals instrument using a sample of 98 high school sophomores. In general, test-retest reliability seemed acceptable. There is no direct evidence available concerning validity of the instrument.

Index of Parental Emphasis upon Independence-Granting in Socialization of the Child.

The developmental Timetable was originated by Irving Torgoff (1960) in an attempt to measure the nature of the balance attained by parents in independence-granting as contrasted with achievement-inducing in child-training. Following is a description by Torgoff of the instrument he devised:

> We have devised an instrument to measure these orientations toward the parental role in an objectively-scorable projective questionnaire called the Parental Developmental Timetable. It consists of two subscales--an A scale, containing items centered on achievement-inducing expectancies; and an I scale, containing items centering on independence-granting expectancies.

> The parent is viewed in both his role as an achievement-inducer as well as an independence-granter in other words, in both the exogenous and endogenous intrinsic components of the parental role, respectively.
>
> In the A subscale, the parental role is viewed as requiring the parent to act as an external agent manipulating the child's development--the parent as teacher, as an agent of socialization. The parent is asked to state the age at which he thinks it appropriate to start to teach, encourage, or train a child to adopt new, more mature, modes of behavior--to teach the child to keep his own room tidy, to correct him when he messes with food, to encourage him to join a library, to teach him that it is wrong to lie or steal, etc.
>
> If we may view the achievement-inducing role as emphasizing "pushing" the child in prescribed directions, in the independence-granting role, we view the parent as one who "lets-go", who permits the child to make his own decisions, take his own chances, take responsibility for determining his own direction of development. The parent is asked the age he thinks appropriate to allow the child to engage in activities requiring autonomy and independence of action and decision--permitting freedom of parental supervision and control. "At what age to allow a child to remain home alone during the day;" to make "dates" without first asking for parental approval; to cross busy streets by himself", etc.

Torgoff's original instrument consisted of 48 items; 24 items relating to parental achievement-inducing expectancies and 24 relating to independence-granting expectancies. The two kinds of items were interspersed to form a single instrument of 48 items.

Because of the length of the questionnaire used in this study, the Developmental Timetable instrument was reduced from 48 items to 36 items. Also, to circumvent problems of interpretation of responses, some items which appeared in Torgoff's instrument were dropped, the wording of other items was changed, and a few new items were added.

The version of the Developmental Timetable used in this study appears in Appendix G. In the instrument appearing in the Appendix, items regarded as relating to parental achievement-inducing expectancies are labeled "A" while items regarded as relating to independence-granting expectancies are labeled "I". In addition, those items adapted from Torgoff's instrument are marked with an asterisk.

Following are examples of items from the version of the Developmental Timetable used in this study:

1. Achievement-Inducing items:
   a. Begin to train him (her) to accept a postponement of what he (she) wants without making a fuss at about age ...
   b. Begin to encourage him (her) to use the public library on his (her) own at about age ...
2. Independence-Granting items:
   a. Begin allowing him (her) to decide for himself (herself) when he (she) should go to bed at about age ...
   b. Begin allowing him (her) a "vote" in decisions which affect all family members at about age ...

In the questionnaire an instruction page preceded the actual instrument (See Appendix G). The name of the child of interest was written in on the instruction page to insure that parents would respond with reference to the specific child. Items in the instrument were worded appropriately for sex of child.

For this study, it was originally decided to use as a basic measure a ratio of the average rank of the ages given by the parent for all achievement-inducing items to the average rank of the ages assigned to all independence-granting items. The original decision to use the AI/IG ratio as a basic measure was based upon Torgoff's findings (1960) that the ratio of AI to IG was a more powerful predictor to independent variables than either AI or IG separately.

Following are the steps taken in transforming the raw data (ages) in order to obtain the mean AI and IG rank and the AI/IG ratio for each parent:

1. Ages given for boys were treated independently of ages given for girls. This was done in order to control for influence of sex of child upon parental responses.

2. For each item in the Developmental Timetable the following operations were performed:

   a. A frequency distribution of ages given by the total sample of mothers and fathers was obtained.

   b. The rank-order of ages for each item was established with N = number of parents who gave usable responses. The lower the age given, the higher the rank.

3. Then, for the responses of each parent, the following operations were performed:

   a. For each item, the age given by the parent was translated into a rank.

   b. The ranks for AI and for IG items were summed and these sums were divided by the number of usable responses given by the parent for AI and IG items. This operation gave a mean rank for AI items and for IG items.

   c. Finally, each parent's mean AI rank was divided by his mean IG rank to provide a value for the AI/IG ratio.

Critical review of the nature of the AI/IG ratio revealed that the measure had considerable ambiguity. For example, an AI/IG ratio of 2.00 (indicating parental emphasis upon the independence-granting component over the achievement-inducing component) could be obtained from any of the following combinations of mean ranks: 4/2, 8/4, 12/6, 50/25, 100/50. Thus, where the parent ranked (on the average) near the top of both AI and IG a relatively minor AI-IG difference would have the same value as a relatively great AI-IG difference for the parent who ranked near the middle on one component and near the bottom on the other.

In view of the ambiguity of the measure, the decision was made to not only use the AI/IG ratio but also to utilize the mean AI and IG ranks obtained for each parent in another way. The procedure followed involved splitting each distribution of mean AI ranks (one for boys and one for girls) and each distribution of mean IG ranks at the median and then classifying each parent according to whether he or she was above or below the median mean rank for each distribution. Thus, each parent was classified as high AI-high IG, high AI-low IG, high IG-low AI or low AI-low IG. By utilizing the mean AI and IG ranks for each parent in this way, it was possible to eliminate much of the ambiguity inherent in the original AI/IG ratio.

Torgoff (1960) has presented evidence concerning the reliability and validity of the Developmental Timetable. Torgoff did find some discrepancy between covert parental emphasis upon role components (as indicated by parental responses to the developmental timetable) and overt behavior of the parent in interaction with the child. However, Torgoff also found evidence of a relationship between curiosity of the child as shown by observations in a nursery school setting and the parent's AI/IG ratio.

Index of Marital Integration.

The index of marital integration, as developed by Farber (1957), is regarded as consisting of two aspects: (a) the integration of ends or goals, which is defined as consensus between husband and wife in their ranking of ten domestic values, and (b) integration of means, which is defined as mutual coordination of domestic roles (or negatively as tension in the system of roles).

Following is a rather complete description by Farber (1960) of the marital integration index:

> The husband and wife each ranked a list of 10 domestic values in order of their importance to family success. The list includes (a) a place in the community, (b) healthy and happy children, (c) companionship, (d) personality development, (e) satisfaction in affection shown, (f) economic security, (g) emotional security, (h) moral and religious unity, (i) everyday interest, and (j) a home. To provide uniformity in interpretation by the respondent, there was a descriptive statement for each value. To measure the extent of agreement between husband and wife, their rankings were correlated, and the size of the coefficient of rank correlation was regarded as an index of the degree of consensus.
>
> The mutual coordination of domestic roles implies that there is (a) agreement or at least consistency between husband and wife on each other's and on one's own expected behavior, (b) agreement between husband and wife as to which expected behavior or role is appropriate for specific kinds of situations, and (c) motivation to conform to the other's expectations and sensitivity to changes in each other's expectations. When these conditions are not fulfilled, the system of marital roles cannot be effectively coordinated. The extent to which the conditions are not fulfilled determines the amount of tension in the system of roles.
>
> The ratings by husband and wife on the same 10 personality traits as those in the perceived similarity indices formed the basis for measuring tension in the system of marital roles. These traits were (a) gets angry easily, (b) stubborn, (c) jealous, (d) irritable, (e) dominating, (f) moody, (g) self-centered, (h) easily hurt, (i) easily excited, and (j) depressed. The items had been selected on the basis of their high loadings on a single factor in which marital adjustment was also high. The ratings were made on a five-point scale from has the trait very much to hasn't the trait at all. For each item, "very much" received a -2 and "not at all," a +2. The scores for the husband's ratings for his wife and himself and the wife's ratings for her husband and herself were added together to provide a role tension score.
>
> The consensus and role tension indices were combined arbitrarily by (a) assigning a score of 3 to couples in the top quartile in each index down to a 0 to those in the lowest quartile and (b) adding each couple's quartile scores for both the consensus and role tension index together to provide a single marital integration score for the couple.

As computed for families in this study, maritial integration scores range from 0 to 6. The higher the score the greater the degree of integration in the marriage.

Several investigations have been made regarding the utility, validity, and reliability of the marital integration index Farber (1957, 1959, 1960a, 1960b, 1962); Farber, Jenne and Toigo (1960); Farber and McHale (1959); Kerchhoff and Davis (1962). In general, the results revealed the index to be both valid and reliable.

The instruments used in this study containing the ten domestic values and the ten negative personality traits appears in Appendix G.

In addition to the marital integration score, several other measures derived from the instruments composing the marital integration index were used in this study. One set of such measures include components of the marital integration index. A second set included parent-child role tension scores.

Component Scores from Marital Integration Index.

As described above, the marital integration index score is composed of five components: (a) consensus on values as measured by Spearman rank correlation coefficient, (b) fathers rating of self on ten negative personality traits, (c) father's rating of mother on ten negative personality traits, (d) mother's rating of self on ten negative traits and (e) mother's rating of father on the ten traits. In addition, the mother-father role tension index was also included as a component.

The decision to include the 6 component scores in the analysis was based on the possibility that the components might relate differently to dependent variables. If only the marital integration score were used, then relationships between component scores and the dependent variables would be obscured.

The measure of consensus on domestic values (Spearman rank correlation coefficient) ranged from +1.00 to -1.00. In order to eliminate negative quantities, 1.00 was added to each Rho value.

The trait rating scores ranged from -20 to +20 for each individual component measure described above. To eliminate negative quantities, 100 was added to each individual's score for self and spouse.

The role tension index scores (father's rating for self and father's rating for mother and mother's rating for self and mother's rating for father) had a theoretical range of -80 to +80. Again, 100 was added to each score to eliminate negative quantities. The higher the score the less the perceived tension in the role system.

Parent-Child Role Tension Scores.

In this study, each parent was asked not only to rate his spouse on each personality trait but also to rate the specific child of interest in the study. The parents' ratings of the child on the ten negative traits were regarded as an index of parent-child role tension. The parent-child role tension scores were computed in exactly the same way as the parental role tension scores. Two scores were computed for each family; one for father's rating of the child and one for mother's rating.

Family Organization Types.

Farber's index of marital integration provides a quantitative measure of the degree of integration which obtains between husband and wife. In contrast, the qualitative aspect of social organization can be viewed in terms of specific values and norms used by husband and wife in governing their actions as family members. Farber (1960a) has viewed the configuration of values and norms as a scheme of priorities used to resolve certain predicaments faced by groups. Thus, according to Farber, the qualitative aspect of social organization of a group can be characterized by the type of priority scheme which it espouses.

In an investigation of how parents of a severely mentally retarded child were able to maintain a high degree of marital integration, Farber (1960a) delineated three priority schemes which were related to high marital integration. These priority schemes, referred to as strategic orientations, were called (a) child-oriented, (b) home-oriented, and (c) parent-oriented.

1. The child-oriented strategy. The parents agree that the most important task in family life is maintenance of the family unit as an ongoing concern in relation to all other social groups. Essentially, through a sharp division of labor, both parents organize their family life around the needs and demands of their children.

2. The home-oriented strategy. The husband minimizes his task of relating the family to outside groups and emphasizes the internal structuring of the family. With the husband taking on a social-emotional task which usually falls primarily to the wife, the division of parental labor within the family is minimized. Both parents concentrate on structuring congenial interpersonal relations in the home.

3. The parent-oriented strategy. Husband and wife agree that children's demands be subordinated to the demands of the husband's role. The wife joins the husband in reinforcing such goals as the acquiring of artifacts and social contacts which symbolize success in middle-class American society. The wife developes skills which enable her to effectively collaborate with her husband in the pursuit of these goals. Since the wife takes on some achievement tasks ordinarily performed by the husband, the husband must perform some of the social-emotional tasks ordinarily carried out by the wife. The net result is minimization of parental division of labor with both parents stressing achievement, personal development, and social skills. Companionate practices in family life tend to be the rule.

In each of the three strategic orientations listed above there is implied a clearcut focus of the parents upon one aspect of family life. Families falling into residual categories are regarded as (a) either lacking in focus upon one aspect of family life or (b) being organized in such a way as to impede satisfaction to be gained from pursuit of a common orientation. In Farber's system, families are classified into two residual categories: called the "mixed" and "residual" categories. In families in the "mixed" category either (a) both parents were pursuing different strategic orientations or (b) one parent was pursuing a strategic orientation while the other was not pursuing any consistent orientation. In families in the residual category neither parent was pursuing one of the three strategic orientations.

The original method used in classifying families as to type of family organization is reported elsewhere by Farber (1960a). A simpler method in classifying families was later developed by Farber and is the method used in this investigation. This simpler method permits classification of families on the basis of the husband's and wife's ranking of the ten domestic values. Previous research by Farber (1960a) had indicated a relationship between the manner in which husbands and wives ranked the domestic values and type of family organization. Thus, six sets of "ideal" rankings of the ten domestic values were established; three sets for child-, home-, and parent-oriented husbands and three sets for child-, home-, and parent-oriented wives. The basic method was to compare actual rankings given by parents with each "ideal" ranking. Provided a minimum degree of positive relationship was obtained, the parent was classified as child-, home-, or parent-oriented according to that "ideal" rank order to which his own rank order most closely agreed.

Inasmuch as the parents in this study had all completed the instrument containing the ten domestic values, the actual ranking of the domestic values of each parent was systematically compared with each of the "ideal" rankings referred to above. For those families in which the husband's and wife's actual rankings were both in sufficient agreement with the same sets of ideal rankings, that family was classified as child-, home-, or parent-oriented. For those families in which neither the husband's nor the wife's actual rankings of domestic values were in sufficient agreement with any of the sets of ideal rankings, that family was classified as residual category. For those families in which the husband's and wife's actual rankings were both in sufficient agreement with a set of ideal rankings but with different sets, or if one spouse's actual ranking was in sufficient agreement with one or more of the sets of ideal rankings but the actual ranking of the other spouse was not in sufficient agreement with any of the sets of ideal rankings, that family was classified as "mixed" orientation.

The ideal rankings used as the criteria in determining family type are reported by Farber (1960a).

The degree of agreement between actual rankings of the ten domestic values given by the parents and the "ideal" rank orders was ascertained by comparing each actual rank order with the ideal rank orders and computing the sum of the squares of the differences between the rankings. The criteria for "sufficient agreement" were as follows: (a) for a single parent (either father or mother) to be classified as child-, home-, or parent-oriented; the sum of the squares of the differences between actual rank order and ideal rank order could not exceed 75. (b) For both father and mother to be classified as child-, home-, or parent-oriented; the combined (father plus mother) sums of squares on a single family type could not exceed 150.

Demographic-Ecological Variables

In Part I of the questionnaire, both parents were asked to give information about demographic-ecological aspects of the family. For the most part, both father and mother independently gave the same information; thereby permitting cross-checks for reliability and consistency of information. Where there were conflicts on such data as ages of children, date of marriage, etc., the information given by the mother was used.

The demographic-ecological variables used in this study are listed and briefly discussed below.

1. Number of persons living in household: Each parent was asked to list the first names and the relationship (wife, husband, son, daughter, mother-in-law, etc.) of all persons living in the house or apartment at the time that the questionnaire was filled out. Of the 117 families included in the study, only 9 listed persons other than members of the nuclear family as living in the household. The data were coded in the following manner: Up to 8 persons were coded as the number given; 9 or more persons were coded as "9".

2. Number of children in family living at home: Each parent listed the number of children living in the household at the time the questionnaire was filled out. Where a second marriage had occured, children of both parents were counted. Data regarding number of children were coded in the same manner as data for number of persons living in household.

3. Birth order of child in classroom performance study: Birth order was determined by ages given by parents. Four classifications of birth order were used: (a) Oldest child (first born), (b) middle child (not first born, not youngest), (c) youngest child and (d) only child.

4. Sex of siblings of child in classroom performance study: Four classifications were used in coding data given by parents on sex of children: (a) all siblings same sex as child in study, (b) all siblings opposite sex of child in study, (c) siblings of both same and opposite sex and (d) no siblings.

5. Ages of parents: Each parent gave date of birth and date on which he filled out the questionnaire. Age was computed on the basis of the two dates and coded directly as the computed age. All ages were computed as of last birthday to the nearest whole year.

6. Age of father and of mother at time of marriage: Age at marriage was computed on the basis of two dates given by the parents: (a) Date of birth and (b) date of marriage. Ages were coded to the nearest whole year on the basis of age of parent at last birthday celebration at time of marriage.

7. Number of years parents married: Number of years married was computed on the basis of (a) date of marriage and (b) date questionnaire was filled out. Only mothers' information was used unless not available. Data were coded to the nearest whole year on the basis of last anniversary celebration.

8. Number of years of education of father and mother: Parents gave the last grade that they completed in the last school attended. Years of formal education completed were coded as follows: 1 to 17 years of formal education were coded as number of years; 18 or more years were coded as "18".

9. Age at which father completed formal education: Each father was asked to give the year in which he completed his formal education. The difference between father's year of birth and year in which formal education was completed was entered as the age at which father completed education.

Index of Socio-economic Status

Father's occupation was used as the basic indicator of the family's socio-economic status. In the questionnaire, each father was asked to describe his usual occupation and the business or industry in which he worked. On the basis of the information given by the fathers, a brief description of the occupation; e.g., "pharmaceutical detail salesman," "college teacher-Professor of English", was written.

The actual index of socio-economic status used in this study is one developed by Otis Dudley Duncan and described in Reiss (1961). Duncan's index, called "a socio-economic index for occupations," permits stratification of a series of occupations as to the "prestige" of each occupation. Duncan's index is based upon the demonstrably high correlation between the independently rated prestige of an occupation and the income and education level of the incumbents as indicated by census data. Duncan's index, then, is an estimated prestige rating based upon weighted percentages of occupational incumbents who were (a) high school graduates and (b) reported a yearly income of $3500 or more in 1949. The higher the value of the index number, the greater the prestige of the occupation. Duncan provides an index number for all of the occupations listed in the detailed classification published by the Bureau of the Census in 1950.

In this study, the description of each father's occupation was matched with an occupation appearing in the list given in Duncan's index. The occupation was then assigned its designated index number. This index number was coded as given and served as the measure of socio-economic status of the family. The index values for the families included in this study ranged from a maximum of 96 (Dentist) to a minimum of 19 (Locker room attendant, Carpenter).

Gainful Employment of Father and Mother

Aside from father's occupation, other data were gathered concerning the gainful employment of both parents. The variables which were included in analyses of the data are described below.

1. Number of years father engaged in present occupation. Each father was asked the following question: "About how long have you been engaged in your present major occupation? (Do not count promotions, changes in location of work, etc. as changes in occupation.)" Data were coded directly as the number of years indicated by the respondent; i.e., "six years" was coded as "6", "twenty-six years" was coded as "26", etc.

2. Number of occupations father had since completing formal education. Each father was asked to do the following: "Please list all of the occupations or lines of work that you have engaged in since you completed your formal education." Again, respondents were cautioned not to consider promotions or changes in place of work as changes in occupation. If the father listed from one to eight occupations, the number of occupations was coded as given. A listing of nine or more was coded as "9".

3. Average number of hours per week mother spends at paying job. Each mother who was employed at the time of the study was asked the following question in the questionnaire: "What is the average number of hours per week that you spend at your job?" The responses given were classified as follows: (a) not employed, (b) employed less than 10 hours per week, (c) 10 to 20 hours per week, (d) 21 to 30 hours per week, (e) 31 to 40 hours per week and (f) more than 40 hours per week. Data were coded so as to form an ordinal scale; i.e., "not employed" was coded as "0", "less than 10 hours per week" was coded as "1", . . . "more than 40 hours per week" was coded as "5".

4. Mother's employment since marriage. For each year beginning with the year of her marriage, each mother checked the years during which she was employed for pay for at least two months of that year, either full-time (40 hours per week) or part-time (less than 40 hours per week). Then, the per cent of years employed since marriage to total number of years married was computed. The percentages obtained were classified and coded as follows: (a) Never employed since marriage coded as "1", (b) employed 1 to 19 per cent of years married was coded as "2", (c) 20 to 39 per cent of years was coded as "3", (d) 40 to 59 per cent of years was coded as "4", (e) 60 to 79 per cent of years was coded as "5", (f) 80 to 99 per cent of years was coded as "6" and (g) 100 per cent of years was coded as "7".

5. Mother's employment in relation to birth of child. Each mother had indicated the years since marriage during which she had been gainfully employed for at least two months. In addition, the birthdate of the child in the classroom performance study was known. Thus, it was possible to determine the mother's employment in relation to the birth of the child. Accordingly, the following categories were developed to describe mother's employment:

a. Never employed since marriage.

b. Employed continuously since marriage (allowing one year of non-employment for each child in the family).

c. Employed at some time since marriage but only prior to or during year of birth of child who took part in study.

d. Employed since marriage and at some time during the period between year of birth of child and year of child's sixth birthday, but not continuously.

e. Employed since marriage and after year of birth of child of interest but not employed during period between year of birth and year of sixth birthday of child.

6. Reasons for mother's employment since marriage. Each mother was asked to check any or all of the following reasons for working after her marriage:

a. You think a wife should retain economic independence.
b. A wife is a better companion when working.
c. You enjoy your work so much.
d. You need something to keep you busy.
e. Your income is not sufficient for all you need.
f. You are trying to accumulate some savings.

Respondents were allowed space to write in other reasons instead of or in addition to the items presented. In analyzing the data, the mothers were classified into two groups on the basis of their indicated reasons for working. Group I included those whose only reason(s) for working was financial; i.e., they checked items a, e, and/or f above or gave an open-end response which indicated a financial reason. Group II included those mothers who checked b, c, and/or d above or otherwise indicated that at least one of their reasons for working was related to mental health or other non-financial considerations. In short, Group I checked only financial reasons while Group II checked (or gave) a mental health or non-financial reason for working but may also have indicated a financial reason.

Indices of Parental Involvement with School Child was Attending

Getzels and Jackson (1961, 1962) reported a relationship between parental "vigilance" regarding the school attended by the child and "creativity" manifested by the child. Therefore, information concerning parent-school relations was gathered in this study. The indices of parental involvement with the school are described below.

1. Frequency of attendance at PTA meetings. Each parent in the study was asked the following question in the questionnaire: "About how many times have you attended Parent-Teacher Association meetings during the present school year (September, 1961 to present)?" The information given was coded as follows: A reported attendance of 0 to 7 times was coded as given, frequencies of 8 or more were coded as "8".

2. PTA involvement. Each parent listed the PTA offices that they ever held and/or the PTA committees upon which they served. Parents were instructed to list only activities connected with the school that the specific child of interest in this study was attending.

3. Contact with teachers. Each parent was asked to do the following: "Please give the last names of those teachers at (name of school) that you have met and spoken to in person." The number of teachers listed was coded as follows: Zero to 7 teachers listed was coded as the number given; 8 or more teachers was coded as "8".

4. Parent-Teacher conferences. Each parent was asked the following question: "Have you ever requested a conference with any of the (name of school) teachers, counselors, or administrative staff in order to discuss your child's progress in school?" Parents checked either "Yes" or "No".

METHODS AND TECHNIQUES OF DATA ANALYSIS

Since the purpose of the family study is to develop hypotheses rather than to test them, it was thought appropriate to use factor analytic techniques in analysis of the data. According to Cattell (1952), factor analysis is an ideal method for "open exploration in regions unstructured by present knowledge." Therefore, all data resulting from the family study which seemed to meet the requirements of at least an ordinal scale were included in a factor analysis. (Actually, most of the data included in the factor analysis could be assumed to meet the requirements of an interval scale.)

Two sets of factor analyses were performed. First, data resulting from the family study were analyzed. Then, individual component (factor) scores derived from the first factor analysis were included in a second factor analysis which also included data relating to classroom performance and divergent thinking ability of the children of interest. These two sets of factor analyses are described more fully below.

In the first set of analyses involving family data only, data from families with a boy in the study were analyzed separately from data from families with a girl in the study. First, a matrix of zero-order Pearson product-moment correlation coefficients was computed for each set of data (boys and girls). Then the matrices of correlation coefficients were subjected to a principal axis factor analysis according to a procedure developed by Hotelling (1933). The criterion used for when to stop factoring is similar to one described by Dickman (1960). The principal axis factors were rotated to orthogonal simple structure by means of the Varimax method as developed and described by Kaiser (1958). A rotational procedure which provided orthogonal (rather than oblique) simple structure was necessary in view of the subsequent computation of individual factor scores based upon the rotated factors. Finally, the rotated factors, the inverse of the correlation matrix and the matrix of standardized raw scores were subjected to a series of matrix multiplication operations which resulted in the calculation of component (factor) scores for each family in the analysis. In this way, the set of raw scores contributed by each family was reduced to a smaller set of individual component or factor scores. The method of computing individual component scores used here is described by Kaiser (1962). This method gives exact scores in the sense that it is possible to arrive back at the exact standardized raw scores for each family by simply reversing the process of matrix multiplication.

After individual factor scores were obtained for boys' families and for girls' families, the factor scores were included in a second set of factor analyses along with data concerning the child's classroom performance, scores on paper and pencil tests of divergent thinking, and other data. Once again matrices of correlation coefficients were computed from the raw data and the correlation matrices were factored by means of the principal axis method. The criterion for when to stop factoring was the same as was employed in the first set of analyses. However, inasmuch as the purpose of the second set of factor analyses was to obtain factors to be interpreted (rather than to obtain factor or component scores), a method of rotation to obtain oblique (rather than orthogonal) simple structure was chosen. According to Cattell (1952), oblique rotation permits a closer approach to "natural factors" than do rotational procedures which operate with strictly orthogonal factors. The rotational procedure chosen for approximation of oblique simple structure was the Oblimax method as developed by Pinzka and Saunders (1954). These last sets of oblique factors constituted the end result of the main portion of the data analysis.

While the factor analyses involved the major portion of the available family data, a few nominal classifications of interest could not be included. Thus, two separate sub-analyses were performed. The first involved analysis of the relationship between parental emphasis upon achievement-inducing in child-training (high versus low), independence-granting (high versus low) and child's total expressiveness and divergent production in the classroom. The second sub-analysis involved the relationships between type of family organization espoused by the parents (Child-oriented, Home-oriented, Parent-oriented) and child's total expressiveness and divergent production in the classroom. For these two sub-analyses, the Mann-Whitney U Test and the Kruskal-Wallis Test for K independent samples was used. These tests are described and discussed by Siegel (1956).

In conjunction with the use of the Mann-Whitney U Test and the Kruskal-Wallis test, the .10 level of significance was used as the criterion for whether or not a given difference was to be taken seriously. In all cases, two-tailed tests of significance were used.

All computations involving factor analysis and factor scores were performed on an IBM 7094 computer in the University of Illinois' Digital Computer Laboratory. The University of Illinois' Statistical Service Unit provided the computer programs and professional help in preparing the data for the computer system.

RESULTS

In this section the results of the data analyses are presented and interpreted. In effect, two major data analyses are reported; one involving 61 boys and their families and the other involving 56 girls and their families.

First, for the boys, the results of a factor analysis of data pertaining to family environment are presented. Then, the results of a second-order factor analysis are presented. The second-order factor analysis includes individual factor scores derived from the first analysis plus data concerning the child's classroom performance, divergent thinking ability, teacher's rating of his cognitive ability and sociability and child's responses to certain semantic differential concepts. Following presentation of the factor analyses pertaining to the boys' data, the results of an identical set of factor analyses of girls' data are presented.

Following presentation of the factor analysis results, a summary of the results and a discussion of boy-girl differences is presented. Then, the results of an analysis of the relationship between parental emphasis upon achievement-inducing and independence-granting and certain aspects of the child's classroom performance are presented for both boys and girls. Finally, the relationship between type of family organization and the child's classroom performance is analyzed for both boys and girls.

Results of Factor Analyses

Only those measures which met the requirements of an interval or ordinal scale were included in the factor analyses. Nominal classifications, such as type of family organization, were not included.

In the factor analyses, the data were first transformed into a zero-order correlation matrix, factors were extracted by means of the principal axis method and the principal axis factors were then rotated to orthogonal simple structure by means of the varimax method. All discussion of factors refers to the rotated factors only.

In the description of factors, two kinds of explained variance are given. The first is the per cent of the total variance bound up in the correlation matrix which is explained by each principal axis factor. The second, called common factor variance, is the per cent of that portion of the total variance explained by all of the extracted factors which is explained by each rotated factor. Thus, if all of the principal axis factors taken together explain 80 per cent of the total variance in the correlation matrix, then the common factor variance explained by a rotated factor is expressed in terms of per cent of the 80 per cent of the total explained variance.

One other note. An important by-product of the factor analyses of data gathered from families with a boy or a girl in the study of classroom performance was the calculation of individual factor (component) scores to be included in a subsequent second-order factor analysis. Inasmuch as the family factors (as factor scores) play an important role in subsequent analyses, the family factors are described partly in terms of their meaning as a factor score.

Factor Analysis of Boys' Family Data

Table 37 shows the 48 measures derived from family data which were included in the analysis, the 16 rotated factors and both the per cent of total variance explained by each principal axis factor and the per cent of common factor variance explained by each varimax factor.

Factor I has loadings of .4 or greater on the following 7 variables:

27.	Father-mother role tension score..................	.92
24.	Mother's personality trait rating for father.......	.82
26.	Mother's personality trait rating for child........	.78
22.	Mother's personality trait rating for self.........	.72

TABLE 37

Varimax Factors Derived from Families with a Boy in the Study

		I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI
1.	Father's satisfaction with instrumental activity	29	01	11	-19	72	28	03	14	14	14	-12	13	-15	07	-04	11
2.	Mother's satisfaction with instrumental activity	22	-05	04	03	08	16	02	86	07	13	-13	-00	-04	04	-05	09
3.	Child's perception of father's satisfaction with instrumental activity	-02	81	02	23	-13	15	-04	08	14	20	04	-22	-05	-02	-09	-07
4.	Child's perception of mother's satisfaction with instrumental activity	-15	76	07	-12	-06	-06	-11	-03	16	13	-04	-09	03	-31	09	-06
5.	Child-father communication accuracy	19	13	-19	05	29	-04	04	-22	-38	-13	-10	-24	-14	18	47	-12
6.	Child-mother communication accuracy	-04	20	13	-01	03	12	09	16	-28	-11	11	34	23	-47	14	-23
7.	Father's criticalness of child's behavior	-15	-12	07	-05	-89	-08	05	-19	-11	-14	00	-07	01	03	-03	02
8.	Mother's criticalness of child's behavior	-16	07	-10	-11	-27	-02	04	-88	11	00	-15	-02	-02	-02	-04	02
9.	Child's perception of father's criticalness	-01	-94	05	04	01	-05	05	03	02	-03	-08	09	01	-06	06	02
10.	Child's perception of mother's criticalness	-06	-91	-02	01	-11	10	05	02	-05	-04	08	-11	-07	08	-01	-01
11.	Father's satisfaction with social-emotional activity	-03	-02	-11	07	82	-16	01	03	02	-15	15	-02	12	-06	17	-08
12.	Mother's satisfaction with social-emotional activity	04	-13	00	14	46	-14	-25	38	-21	-30	41	-02	13	14	11	-13
13.	Child's perception of father's satisfaction with social-emotional activity	01	65	-19	17	18	-15	-02	-23	-28	-31	16	05	08	12	08	07
14.	Child's perception of mother's satisfaction with social-emotional activity	17	61	-11	20	14	-34	-12	-06	-23	-18	-04	28	-01	19	08	04
15.	Father's emphasis upon independence-granting in child-training	-10	07	-27	12	-06	13	-19	21	-13	68	09	06	-08	-18	-09	09
16.	Mother's emphasis upon independence-granting in child-training	-09	13	-01	21	13	-07	-13	-09	03	74	06	01	04	01	04	-31
17.	Father's emphasis upon independence in ranking of behavior choices	13	03	-45	42	00	17	25	24	08	25	-01	-14	-02	19	-35	01
18.	Mother's emphasis upon independence in ranking of behavior choices	03	-06	03	29	04	29	41	22	-06	52	04	-00	07	20	14	14
19.	Mother-father agreement in ranking of behavior choices	-01	-07	01	01	-02	20	-19	11	-02	-07	-08	01	14	79	11	-19
20.	Father-mother agreement in ranking of ten life goals for children	03	02	-03	03	-08	07	01	-02	-06	-06	-04	37	65	27	-03	-04
21.	Father's personality trait rating for self	61	13	-03	-05	14	11	-38	06	09	-13	-26	-13	02	-12	11	35
22.	Mother's personality trait rating for self	72	-25	10	-03	06	-05	22	02	-00	09	26	08	17	07	20	-08
23.	Father's personality trait rating for mother	69	-02	-07	-08	19	16	-12	05	15	05	-01	19	12	06	74	10
24.	Mother's personality trait rating for father	82	15	-03	-06	-09	-13	-05	14	-16	-03	-00	-01	00	-05	-28	04
25.	Father's personality trait rating for child	52	-02	-23	-11	25	11	-31	06	10	-39	18	12	-19	-15	19	-02
26.	Mother's personality trait rating for child	78	02	-00	-12	20	-06	07	13	-08	-13	19	11	-15	13	-03	-23
27.	Father-mother role tension score	92	-01	02	-05	07	-00	-11	08	01	-01	00	02	07	02	25	10
28.	Father-mother agreement on ranking of ten domestic values	05	06	-07	-12	06	15	-02	-03	05	05	02	-18	84	-07	02	06
29.	Marital integration score	66	-04	-04	-10	09	11	-07	13	05	-03	01	-08	58	-05	26	05
30.	Number of persons living in the household	-06	-12	-16	09	02	-04	92	00	-02	-07	-08	-01	-03	-10	-05	02
31.	Number of children in the family	-05	-12	-14	03	-06	-05	-93	-05	-01	-08	-04	01	-00	-11	-03	-03
32.	Number of years parents married	21	03	-17	10	10	14	-05	-02	-08	12	84	24	-01	-14	-04	06
33.	Age of father in years	14	-06	71	08	01	12	-13	-04	-04	03	33	40	-04	-12	-10	15
34.	Age of mother in years	10	03	67	10	-03	15	-19	10	03	02	61	04	-02	-04	02	03
35.	Father's age in years at time of marriage	-02	-07	88	02	02	00	-02	01	07	-04	-24	14	-07	00	-14	12
36.	Mother's age in years at time of marriage	-08	01	87	03	-13	04	-13	14	10	-10	-08	-21	-03	07	07	-05
37.	Father-Number of years of formal education completed	-13	-06	-09	88	04	07	05	10	-16	13	13	00	-12	-00	-04	-02
38.	Mother-Number of years of formal education completed	-25	-03	28	63	-08	-02	06	13	23	18	13	00	02	10	20	-10
39.	Father's age in years when completed formal education	-03	-01	15	69	05	34	-14	-09	05	04	-16	-25	-02	20	-06	02
40.	Socioeconomic Status index value of father's occupation	-05	-11	-00	80	01	-05	21	01	-29	06	05	11	-03	-23	-09	-13
41.	Number of years father has been in present occupation	05	-11	15	-13	18	06	06	-04	-07	05	28	77	-05	-02	-02	-06
42.	Number of occupations father engaged in since completed formal education	00	-04	13	-12	-05	-09	-00	05	04	-10	06	-05	04	-10	04	92
43.	Average number of hours per week mother works at paying job	07	23	08	-05	15	02	-06	-14	82	-02	-15	-06	10	-15	-03	01
44.	Mother-Proportion of years worked since marriage/years married	-13	-09	04	-13	05	-11	02	06	77	-07	03	-04	-08	18	10	03
45.	Father-Frequency of attendance at PTA meetings	-13	-03	15	04	26	71	-02	-19	-08	16	21	11	21	11	-07	-07
46.	Mother-Frequency of attendance at PTA meetings	-20	-03	07	-05	-21	74	-01	17	03	03	06	03	07	01	19	03
47.	Number of teachers father has met in person	23	-08	-05	28	17	74	-02	12	-11	-04	02	-01	07	12	-11	-09
48.	Number of teachers mother has met in person	07	-05	-03	11	-15	54	-20	17	03	-01	-11	53	03	-07	222	-04
	PER CENT OF VARIANCE	12.8	10.4	8.4	8.2	6.1	5.1	5.0	4.7	4.0	3.3	3.1	3.0	2.5	2.4	2.3	2.1
	PER CENT OF COMMON FACTOR VARIANCE	11.2	10.4	8.1	7.7	7.3	6.8	6.6	5.8	5.2	5.2	5.0	4.7	4.6	3.9	3.8	3.6

29.	Marital integration score	.66
21.	Father's personality trait rating for self	.61
25.	Father's personality trait rating for child	.52

Factor I, which explains about 11 per cent of the common factor variance, is labeled the *tension in family interpersonal relations* factor; i.e., the higher the factor (or component) score the greater the tendency for both parents to view themselves, each other and the child as *not* possessing negative personality traits. It is important to recognize that the factor encompasses interpersonal tension as viewed only from the parents' standpoint and that it includes only the father-mother-child triad and not other family members.

Factor II has loadings of .4 or greater on the following 6 variables:

9.	Child's perception of father's criticalness	-.94
10.	Child's perception of mother's criticalness	-.91
3.	Child's perception of father's satisfaction with instrumental activity	.81
4.	Child's perception of mother's satisfaction with instrumental activity	.78
13.	Child's perception of father's satisfaction with social-emotional activity	.65
14.	Child's perception of mother's satisfaction with social-emotional activity	.61

Factor II, which explains about 10 per cent of the common factor variance, is labeled *child's perception of parental satisfaction with behavior*. The higher the factor score the greater the tendency of the child to perceive both of his parents as being generally satisfied with his performance of both instrumental and social-emotional activities.

Factor III has loadings of .4 or greater on the following 5 variables:

35.	Age of father at marriage	.88
36.	Age of mother at marriage	.87
33.	Age of father at time of study	.71
34.	Age of mother at time of study	.67
17.	Father's emphasis upon independence in ranking of behavior choices	-.45

Factor III, which explains about 8 per cent of the common factor variance, is labeled the *parent maturity* factor. The modest negative loading on variable 17 suggests that the older the parents and the older the parents at time of marriage, the greater the tendency for the father to emphasize intellectual dependence and social conformity in his ranking of the behavior choices. Thus the higher the factor score the older the parents (both at time of study and at time of marriage) and (possibly) the greater the paternal emphasis upon intellectual and social conformity on the part of the child.

Factor IV has loadings of .4 or greater on the following 5 variables:

37.	Father's years of formal education completed.......	.88
40.	Socioeconomic Status Index value for father's occupation....................................	.80
39.	Father's age when completed formal education.......	.69
38.	Mother's years of formal education completed.......	.63
17.	Father's emphasis upon independence in ranking of behavior choices................................	.42

Factor IV, which explains about 8 per cent of the common factor variance, is labeled *parental educational-occupational status*. Thus, the higher the factor score the greater the educational attainment of the parents, the higher the status of the father's occupation and the greater the paternal emphasis upon intellectual and social independence in ranking of behavior choices.

Factor V has loadings of .4 or greater on the following 4 variables:

7.	Father's criticalness of child's behavior..........	-.89
11.	Father's satisfaction with child's social-emotional activity..	.82
1.	Father's satisfaction with child's instrumental activity..	.72
12.	Mother's satisfaction with child's social-emotional activity..	.46

Factor V, which explains about 7 per cent of the common factor variance, is labeled *parental satisfaction with child's behavior*. Note, however, that father's satisfaction tends to be global (includes both instrumental and social-emotional activities) while the mother's satisfaction is restricted to social-emotional activities. Thus, the higher the factor score the greater the paternal satisfaction with the child's general performance and the greater the maternal satisfaction with the child's social-emotional activities.

Factor VI has loadings of .4 or greater on the following 4 variables:

46.	Number of times mother attends PTA meetings........	.74
47.	Number of child's teachers father has met and spoken to in person...........................	.74
45.	Number of times father attends PTA meetings........	.71
48.	Number of child's teachers mother has met and spoken to in person...........................	.54

Factor VI, which explains about 7 per cent of the common factor variance, is labeled the parental involvement with school factor. The higher the factor score the greater the frequency with which the parents attend PTA meetings held at the school the child is attending and the greater the parental contact with the child's teachers.

Factor VII has loadings of .4 or greater on the following 3 variables:

31.	Number of children in the family..................	.93
30.	Number of persons living in household.............	.92
18.	Mother's emphasis upon independence in ranking of behavior choices................................	.41

Factor VII, which explains about 7 per cent of the common factor variance, is labeled the family size factor. Thus, the higher the factor score, the larger the family. The marginal loading on mother's ranking of the behavior choices is difficult to interpret. The reader may recall that the greater the rho value the greater the parental emphasis upon traits and characteristics which purportedly relate to development of intellectual independence on the part of the child. It is possible that the configuration of significant loadings given above is the result of the influence of family size upon socialization practices; i.e., the greater the number of persons to be socialized the greater the maternal tendency to relinquish direct and constant control over the child's development. It is important to recognize, however, that the very high loadings on Factor VII relate to family size and that for all practical purposes the factor score will primarily reflect variation in size of family.

Factor VIII has loadings of .4 or greater on the following 2 variables:

8.	Mother's criticalness of child's behavior...........	-.88
2.	Mother's satisfaction with child's instrumental activity...	.86

Factor VIII, which explains about 6 per cent of the common factor variance, is labeled *mother's satisfaction with child's behavior*. Thus, the higher the factor score the greater the mother's satisfaction with the child's performance of instrumental activities and the less critical the mother of the child's general behavior.

Factor IX has loadings of .4 or greater on the following 2 variables:

43.	Average number of hours per week mother works at paying job......................................	.82
44.	Proportion of years mother has worked since marriage to number of years married......................	.77

Factor IX, which explains about 5 per cent of the common factor variance, is labeled the *mother's employment* factor. Thus, the higher the factor score the greater the number of hours per week the mother is currently employed and the greater the proportion of her married years the mother has been gainfully employed for at least two months of the year.

Factor X has loadings of .4 or greater on the following 3 variables:

16.	Mother's emphasis upon independence-granting as opposed to achievement-inducing in child-training..	.74
15.	Father's emphasis upon independence-granting as opposed to achievement-inducing in child-training..	.68
18.	Mother's emphasis upon independence in rankings of behavior choices..................................	.52

Factor X, which explains about 5 per cent of the common factor variance, is labeled *parental emphasis upon development of child's independence*. The higher the factor score the greater the parental emphasis upon independence-granting in socialization of the child and the greater the maternal emphasis upon development of intellectual autonomy in the child.

Factor XI has loadings of .4 or greater on the following 3 variables:

32.	Number of years parents married	.84
34.	Age of mother at time of study	.61
12.	Mother's satisfaction with child's social-emotional behavior	.41

Factor XI, which explains about 5 per cent of the common factor variance, is labeled the *age of marriage* factor. The marginal loading on mother's satisfaction with child's social-emotional behavior is difficult to rationalize. At any rate, the variables relating to years married and age of mother have a much greater influence on the factor score than the variable relating to satisfaction with social-emotional behavior. For all practical purposes, then, the higher the factor score the longer the parents have been married to each other and the older the mother.

Factor XII has loadings of .4 or greater on the following 3 variables:

41.	Number of years father has been in present occupation	.77
48.	Number of child's teachers mother has met and spoken to in person	.53
33.	Age of father at time of study	.40

Factor XII explains about 5 per cent of the common factor variance. It is impossible to adequately label this factor. Perhaps the most appropriate label would be *occupational stability of father*, ignoring the fairly large loading relating to mother's contact with teachers. The larger the factor score, then, the longer the father has been in his present occupation, the greater the mother-teacher contact and the older the father.

Factor XIII has loadings of .4 or greater on the following 3 variables:

28.	Father-mother agreement on domestic values.........	.84
20.	Father-mother agreement on life goals for children.	.65
29.	Marital integration score........................	.58

Factor XIII, which explains about 5 per cent of the common factor variance, is labeled the parental agreement on family values factor. Thus, the higher the factor score the greater the parental agreement on the ranking of ten domestic values relating to family life, the greater the parental agreement on ranking of ten long-term aims of socialization for the child and the higher the marital integration score.

Factor XIV has loadings of .4 or greater on the following 2 variables:

19.	Father-mother agreement on ranking of behavior choices......................................	.79
6.	Child-mother communication accuracy...............	-.47

Factor XIV explains about 4 per cent of the common factor variance. It is impossible to label this factor inasmuch as the relationship between the two variables with fairly high loadings in rather obscure. It is possible that what the factor represents is a parental coalition which, to some extent, excludes the child and renders mother-child communication difficult. However, since the variable relating to parental agreement on behavior choices has easily the higher loading, the factor is labeled parental agreement on behavior choices. Thus, for all practical purposes, the higher the factor score the greater the degree of parental agreement on the ranking of the ten behavior choices.

Factor XV has loadings of .4 or greater on the following 2 variables:

23.	Father's personality trait rating for mother.......	.74
5.	Child-father communication accuracy...............	.47

Factor XV, which explains about 4 per cent of the common factor variance, is labeled father's trait rating of mother. The relation of father's trait rating of mother to child-father communication accuracy is obscure and cannot be explored here. Inasmuch as variable 23 carries the larger loading, it therefore will influence the factor score more than will variable 5. Thus, for all practical purposes, the higher the factor score the more positive the father's personality trait rating of the mother.

Factor XVI has a significantly large loading on the following variable:

42. Number of occupations father has engaged in since completing formal education.................... .92

Factor XVI explains about 4 per cent of the common factor variance. This factor, the last to be extracted, is labeled father's occupational mobility. Thus, the higher the factor score the greater the number of occupations the father has engaged in since completing his formal education.

The sixteen varimax factors derived from 61 families with a boy in the study have been set forth and described. In the section to follow second-order factors derived partly from factor scores obtained in the preceding analysis and from classroom performance data and other information relating to cognitive ability are described.

Second-Order Factor Analysis of Boys' Data

In effect, the sixteen factor scores derived from analysis of family environment data serve as a parsimonious substitution for the forty-eight variables which made up the factor analysis data matrix. Thus, each family now has sixteen individual factor scores instead of the original forty-eight raw scores. The sixteen factor scores (a separate set of scores for each family) are included as part of the raw data matrix for the second-order factor analyses which are described below.

The purpose of the second-order factor analyses is to discover the relationships, if any, which obtain between family environment (as represented by the sixteen individual factor scores) and the child's verbal performance in the classroom, his scores on paper and pencil tests of divergent thinking ability, his rating of concepts included in a semantic differential instrument and his teacher's rating of his cognitive ability and his sociability.

There were 16 boys represented in the factor analysis of family data for whom no classroom performance data were available. Therefore, the individual factor scores for the families of these children were omitted from the second-order factor analyses. Omission of the 16 boys left 45 (61 minus 16) represented in the second-order factor analyses.

For the boys, two second-order factor analyses are performed. The two analyses were performed to take advantage of the fact that for 19 of the 45 boys there were classroom performance data available from more than one classroom setting. For 4 of the 19 boys with two sets of classroom data, the Group A to Group B shift involved a shift from a social science class to a biological science class one year later. For the remaining 15 boys the A to B shift involved moving from a general science class to an English class one year later. For 4 of the boys there were also available new teacher ratings of cognitive ability and sociability and new Uses and Consequences test data from the Group B classroom setting. For all of the 19 boys new Semantic Differential data were available. Where new data (including classroom performance data) were available, they were incorporated into the Group B data matrix. Other than the changes listed above, the Group A and Group B data are identical.

The factors to be presented in this portion of the analysis are oblique factors; i.e., they are not orthogonal. What is actually presented is the reference vector structure rather than the primary factor pattern. The reference vector structure is expressed in terms of correlations between the tests (variables) and the reference vectors rather than in terms of factor loadings. However, in order to facilitate discussion and avoid confusion, the individual elements in the reference vector structure are here referred to as "loadings".

According to Cattell (1952), it is perfectly permissible to present the reference vector structure rather than the primary factor pattern if the aim of the research is to discover the nature of the factors at work in a given area rather than to make predictions for specific individuals by means of the specification equation. Inasmuch as the purpose here is to discover the nature of the factors, the reference vector structure is presented.

Thus, two separate factor analyses are performed on the boys' data; a Group A analysis and a Group B analysis. Table 38 gives the reference vector structure (rotated factors) derived from Group A data and Table 39 gives the reference vector structure derived from Group B data.

Inasmuch as the major focus of interest is upon discovery of relationships between family environment (as represented by the factor scores derived from the family data) and child's cognitive style, as a general rule only the factors which suggest such a relationship are interpreted. The remaining factors are noted but left without discussion.

Finally, to facilitate discussion the Group A and Group B factors are described and interpreted together.

Factor I-A has no counterpart in the Group B factors. Factor I-A has a significant loading on the semantic differential concept Faith (.82) and a more modest loading on the family factor score relating to parental agreement on ranking of behavior choices (.54). Since Factor I-A contains no evidence of a relation between family environment and cognitive style, it is not discussed here.

TABLE 38

Boys Group A: Reference Vector Structure

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII
1. Family Factor I: Tension in family interpersonal relations	-033	-046	-130	016	150	200	159	-816	001	108	171	-171	-092
2. Family Factor II: Child's perception of parental satisfaction with behavior	-179	-050	-025	200	150	-227	098	366	218	-097	341	013	089
3. Family Factor III: Parental maturity	-032	020	007	-080	-121	-210	656	-175	-221	-129	082	083	-090
4. Family Factor IV: Parental educational-occupational status	046	041	226	014	110	-156	-004	003	-795	079	125	140	-033
5. Family Factor V: Parental satisfaction with child's behavior	-067	-794	-175	-160	042	007	-067	064	-068	-090	304	033	-051
6. Family Factor VI: Parental involvement with school	-019	-099	-379	043	014	-094	000	-224	-054	-242	-340	152	277
7. Family Factor VII: Family size	-350	-142	-138	019	-198	361	100	008	045	100	418	-153	121
8. Family Factor VIII: Mother's satisfaction with child's behavior	100	120	-039	918	112	018	-170	010	-014	-098	-015	-044	-132
9. Family Factor IX: Mother'd employment	340	-037	273	026	-027	189	167	-154	-103	-093	061	-382	297
10. Family Factor X: Parental emphasis upon development of child's independence	103	008	246	-096	-895	-167	207	137	111	-256	-002	-334	-063
11. Family Factor XI: Age of marriage	017	107	023	-107	253	-203	-004	-141	-079	860	-022	376	052
12. Family Factor XII: Occupational stability of father	-303	109	215	-236	-039	204	-299	-075	091	-191	006	-493	-211
13. Family Factor XIII: Parental agreement on family values	054	074	-146	-049	027	116	093	292	-088	-273	086	390	035
14. Family Factor XIV: Parental agreement on behavior choices	543	165	-269	-206	-116	117	080	060	049	-032	031	-284	030
15. Family Factor XV: Father's personality trait rating of mother	-030	111	869	060	-210	-164	-158	095	-212	003	156	-250	198
16. Family Factor XVI: Occupational mobility of father	055	037	-167	004	146	853	-318	-191	142	-175	-022	-361	280
17. Child's classroom performance: Cognitive-memory	-008	-056	059	-207	107	076	-015	064	-115	206	015	177	796
18. Child's classroom performance: Divergent thinking	-048	153	063	026	102	216	-027	-094	086	-085	057	-049	865
19. Child's classroom performance: Convergent thinking	121	-091	027	-085	-054	081	-052	070	062	-018	-080	-044	870
20. Child's classroom performance: Evaluative thinking	008	-080	184	073	-068	080	-108	147	-028	033	120	015	801
21. Uses test: Breadth score	-254	109	003	-098	166	-180	314	-034	-340	-066	535	080	226
22. Consequences test: Breadth score	-009	792	064	008	020	047	015	129	-140	027	129	000	-109
23. Semantic differential: Mother	161	-040	043	128	009	141	-328	-160	-060	-019	507	-032	-072
24. Semantic differential: Father	073	-222	235	-012	015	022	-346	007	-141	-119	537	017	-075
25. Semantic differential: Student	-037	082	064	026	-095	-170	-090	-224	190	041	507	-053	087
26. Semantic differential: Work	258	203	-186	-048	059	066	-276	219	-142	047	284	121	-039
27. Semantic differential: Competition	109	-052	145	107	107	132	-747	048	-139	-067	130	-117	075
28. Semantic differential: Success	190	-199	136	-113	103	-107	-125	-100	-061	-020	490	-115	-128
29. Semantic differential: Love	278	088	009	150	-188	-082	209	-169	112	025	523	090	116
30. Semantic differential: Faith	817	040	013	107	-041	011	-207	021	-047	023	-006	-089	029
31. Semantic differential: Imagination	-128	119	031	-160	-035	-198	-342	126	279	051	021	199	246
32. Semantic differential: School	222	-134	-306	-074	-095	-072	-039	-047	081	076	402	139	-083
33. Teacher rating: Cognitive ability	-045	151	036	-080	195	203	143	-117	293	-067	293	057	-082
34. Teacher rating: Sociability	325	-190	046	-042	166	-094	144	143	281	015	-172	047	014

TABLE 39

Boys Group B: Reference Vector Structure

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII
1. Family Factor I: Tension in family interpersonal relations	087	-087	-103	-106	-019	-041	-052	-054	-014	054	144	895	050
2. Family Factor II: Child's perception of parental satisfaction with behavior	-434	-062	-040	200	-184	-123	280	155	-301	-090	-123	-138	-014
3. Family Factor III: Parental maturity	072	-699	203	213	349	037	144	092	-253	-113	189	173	051
4. Family Factor IV: Parental educational-occupational status	344	-028	013	609	080	118	-250	-060	008	-020	-125	-147	-121
5. Family Factor V: Parental satisfaction with child's behavior	-104	227	072	017	-620	-187	-658	079	-104	-064	097	060	-020
6. Family Factor VI: Parental involvement with school	494	324	041	107	-036	259	223	135	-067	-206	-077	114	491
7. Family Factor VII: Family size	-381	-121	165	-039	-174	-891	-161	-005	237	-078	078	035	034
8. Family Factor VIII: Mother's satisfaction with child's behavior	-034	021	-163	073	186	-082	074	102	176	-352	263	-122	-034
9. Family Factor IX: Mother's employment	-029	-223	-094	-024	118	-048	-262	061	042	-182	-433	313	-235
10. Family Factor X: Parental emphasis upon development of child's independence	131	-045	039	-255	176	-238	-056	222	-280	-004	071	-146	-183
11. Family Factor XI: Age of marriage	-246	-136	-263	-046	075	-004	047	-896	-121	-220	047	054	-012
12. Family Factor XII: Occupational stability of father	081	129	-384	-034	-024	045	117	203	183	833	063	036	-167
13. Family Factor XIII: Parental agreement on family values	-057	-049	835	014	017	-142	015	216	016	-314	-083	-081	068
14. Family Factor XIV: Parental agreement on behavior choices	-413	-182	-194	-007	191	-028	-170	-012	-015	035	-199	-002	410
15. Family Factor XV: Father's personality trait rating of mother	218	081	-087	070	-020	068	-067	010	-215	141	-410	-021	-848
16. Family Factor XVI: Occupational mobility of father	-066	139	015	-196	110	-231	-209	128	854	172	-175	-025	203
17. Child's classroom performance: Cognitive-memory	-090	-010	020	095	-039	-036	046	-200	135	-054	-833	-129	-094
18. Child's classroom performance: Divergent thinking	159	056	118	066	042	096	267	198	035	017	-784	105	-122
19. Child's classroom performance: Convergent thinking	-050	072	069	002	-008	011	019	014	080	-109	-862	-172	-032
20. Child's classroom performance: Evaluative thinking	028	051	-030	044	-039	033	128	067	005	067	-862	-027	-221
21. Uses test: Breadth score	085	-164	-002	813	098	011	225	058	-182	010	-085	-040	029
22. Consequences test: Breadth score	-013	-162	050	325	529	-003	428	039	078	208	077	-067	087
23. Semantic differential: Mother	-351	056	392	-112	078	-039	-167	063	190	-144	-217	040	178
24. Semantic differential: Father	017	355	198	116	-071	-046	-463	080	-054	021	226	030	-110
25. Semantic differential: Student	-239	173	-021	-074	212	-005	-109	-233	-180	-072	000	129	-088
26. Semantic differential: Work	000	199	-072	215	263	-089	-373	-105	096	065	099	-136	020
27. Semantic differential: Competition	306	718	-070	-014	-100	128	-370	153	055	042	-002	009	-098
28. Semantic differential: Success	-197	187	-029	199	-127	126	-274	182	-000	350	102	038	-027
29. Semantic differential: Love	-232	-050	133	-013	398	-025	-159	-146	003	-194	-064	011	-207
30. Semantic differential: Faith	-109	076	-079	-359	257	125	-492	127	018	-018	044	-060	-004
31. Semantic differential: Imagination	-007	384	159	-198	-067	-034	241	-183	-131	062	-164	-019	008
32. Semantic differential: School	-118	314	025	101	149	097	-344	-037	-009	-189	075	023	183
33. Teacher rating: Cognitive ability	-091	-100	379	-049	189	138	112	027	104	-065	169	074	-205
34. Teacher rating: Sociability	-097	-109	066	-265	-126	383	-067	012	-099	-144	092	-285	-015

Factor II-A does give evidence of a relationship between family environment and cognitive style. Furthermore, II-A appears to be related to Factors V-B and VII-B. Following is a listing of the variables with a loading of .4 or greater on at least one of the three factors:

		II-A	V-B	VII-B
5.	Family Factor V: Parental satisfaction with child's behavior....................	-.79	-.62	-.66
22.	Consequences test: Breadth score..........	.79	.53	.43
30.	Semantic Differential: Faith..............	.04	.26	-.49
24.	Semantic Differential: Father.............	-.22	-.07	-.46

The important and interesting similarity between Factors II-A, V-B and VII-B is the pattern of loadings for parental satisfaction with child's behavior and Consequences Test Breadth score. The pattern suggests that the less satisfied the parent with the child's behavior the greater the child's breadth score on the Consequences Test. These factors are labeled the dissatisfied-searching factors. According to a conceptual model developed by Farber (1963), the parent who is not satisfied with the child's behavior will stimulate the child to search for alternate modes of behavior which meet parental standards. Provided that the parental dissatisfaction is accurately communicated to the child (so that he will know that he must seek new alternatives) and assuming that a "searching orientation" generalizes to include a wide variety of situations faced by the child, then it seems plausible that the "searching" child might tend to give a greater variety of responses on the Consequences Test. The pattern suggests that perhaps productive thinking is related to a particular kind of parent-child or superordinate-subordinate relationship -- one in which the subordinate is made aware of shortcomings but is at the same time allowed some freedom in finding acceptable alternatives. Thus, for example, Drews and Teahan (1957) report that mothers of high achieving junior high school students had higher scores on dominating and ignoring scales than did mothers of low achieving students but that mothers of high achievers did not have higher scores on a possessive scale.

Factor III-A and Factor XIII-B are similar in that each has a significant loading on Family Factor XV: Father's trait rating of mother (the loadings are .88 and -.85 respectively). Factor XIII-B, however, also has modest loadings for Family Factor VI - Parental involvement with school (.49) and Family Factor XIV - Parental agreement on ranking of behavior choices (.41). Neither factor is of particular interest here.

Factor IV-A has a single significant loading on Family Factor VIII - Mother's satisfaction with child's behavior (.92). Factor IV-A, which has no direct counterpart among the Group B factors, is of little interest here.

Factor V-A has a single significant loading on Family Factor X - Parental emphasis upon development of child's independence (-.90), has no direct counterpart among the Group B factors and is of little interest here.

Factor VI-A and Factor IX-B are virtually identical in that each has a single significant loading on Family Factor XVI - Occupational mobility of father (.85 loading for both factors.) Neither factor will be discussed here.

Factor VII-A has a direct counterpart in Factor II-B. Each has loadings of .4 or greater on the following two variables:

	VII-A	II-B
27. Semantic differential: Competition..........	-.75	.72
3. Family Factor III: Parental maturity.........	.66	-.70

While they do not suggest a relationship between family environment and cognitive style, Factors VII-A and II-B are of interest in that they suggest that as parental age and age at marriage increase boys' ratings of the semantic differential concept of Competition decrease in favorableness. Keeping in mind that all of the boys in the study are of approximately the same age, the fact that parental age (and age at marriage) is related to the child's rating of Competition makes sense if we assume that parental values are, to some extent, transmitted to their children. Perhaps the older and occupationally and socially well established parent tends to focus upon conserving what has been won. For the older parent the struggle for status and prestige has either been won or is no longer an issue of vital importance. For the younger parent, however, the battle may still be joined. A spirit of competitiveness would be of value in such a contest. Thus, it seems reasonable that children of younger parents would tend to rate Competition more favorably than children of older parents. Of course, it is also possible that the crucial element in family environment is not the current age of the parent but the age at which the parents were married. It may be that those who marry relatively late do so out of fear of being handicapped in the competitive struggle by an early marriage. If age at marriage is the crucial element it would suggest that those parents who marry late have always had a less favorable view of the processes of competition and that they communicate this view to the child.

Factors VIII-A and XII-B are similar in that both have a single significant loading on Family Factor I - Tension in family interpersonal relations (-.82 and .90 respectively). Neither factor will be discussed here.

Factor IX-A has no counterpart among the Group B factors, has a single significant loading on Family Factor IV - Parental educational-occupational status (-.80), and is of little interest.

Factors X-A and VIII-B are similar in that both have a single significant loading on Family Factor XI - Age of marriage (.86 and -.90 respectively). Neither factor will be discussed here.

Factor XI-A has no counterpart among the Group B factors. XI-A is of some interest here in that is has modest loadings on variables relating to cognitive style and to family background. Following is a listing of the variables in Factor XI-A with a loading of .4 or greater:

24.	Semantic differential: Father	.54
21.	Uses test: Breadth score	.53
29.	Semantic differential: Love	.52
23.	Semantic differential: Mother	.51
25.	Semantic differential: Student	.51
28.	Semantic differential: Success	.49
7.	Family Factor VII: Family size	.42
32.	Semantic differential: School	.40

Factor XI-A carries a faint hint that the larger the family the greater the number of different responses given by the child in the Uses test. However, the relationship between family size and Uses test score is clouded by the appearance of several modest loadings for semantic differential concepts. Further analysis would be required to determine the exact nature of the relationship (if any) between family size and breadth score on the Uses test.

Factor XII-A has a counterpart in Factor X-B. Both factors carry a single significant loading on Family Factor XII - Occupational stability of father. Neither factor will be discussed here.

Factor XIII-A and Factor XI-B have much in common. Following is a listing of the variables which have a loading of .4 or greater on at least one of the factors:

		XIII-A	XI-B
19.	Classroom performance: Convergent thinking	.87	-.86
18.	Classroom performance: Divergent thinking	.87	-.78
20.	Classroom performance: Evaluative thinking	.80	-.86
17.	Classroom performance: Cognitive-memory	.80	-.83
9.	Family Factor IX: Mother's employment	.30	-.43
15.	Family Factor XV: Father's personality trait rating of mother	.20	-.41

Patterns of sizable loadings clearly indicate that both of the above factors are classroom performance factors. However, in Factor XI-B, there is a slight hint of a relationship between mother's employment, father's personality trait rating of mother and the child's classroom performance. The evidence, however, is not clear for the loadings in Factor XI-B on the family environment variables are borderline. There would seem to be little point in speculating on the basis of such questionable evidence, especially in view of the complexity of the relationship between maternal employment and the child's personality and achievement motivation, a complexity which has been pointed out by Maccoby (1960) and others.

Four Group B factors remain to be discussed. Factor I-B has modest loadings on Family Factor VI - Parental involvement with school (.49), Family Factor II - Child's perception of parental satisfaction with behavior (-.43) and Family Factor XIV - Parental agreement on behavior choices (-.41). Factor III-B has a loading of greater than .4 on only one variable -- Family Factor XIII - Parental agreement on family values (.84). Factor VI-B carries a single sizable loading on Family Factor VII - Family size. Thus, I-B, III-B and VI-B are of little interest here.

Factor IV-B, however, is of interest. Factor IV-B has loadings of .4 or greater on the following two variables:

21.	Uses test: Breadth score..........................	.81
4.	Family Factor IV: Parental educational-occupational status...	.61

Factor IV-B suggests that there is a relationship between number of years of education completed by the parents, the socioeconomic status of the father's occupation and the child's breadth score on the Uses test. It is generally agreed that the higher the educational attainments of the parents and the higher the socioeconomic status of the family the broader and more stimulating the experience of the child and the greater the language facility of the child. What Factor IV-B may reflect, then, is the broader experience and greater language facility of the child from an especially advantaged home in comparison with the child from a less advantaged home with a narrower range of general experience and slightly less language facility. The reader may recall that, in the Uses test, the child is required to list as many uses as he or she can think of for such common objects as bricks, screwdrivers, newspapers, etc., in a limited amount of time. Under these circumstances, it would seem that range of experience and language facility would be crucial elements in determining quality of performance.

Summary of Results: Boys' Second-Order Factor Analyses

Perhaps the most striking result of the factor analyses of boys' data was the absence of evidence about clear cut relations between classroom performance and family environment as represented by the sixteen factor scores. One possible reason for the lack of relationships between family environment and classroom performance is the relative homogeneity of the sample of families with respect to socioeconomic status and educational attainment of the parents. Also, it must be remembered that virtually all of the youngsters whose families were included in the sample are classified as "gifted," a circumstance which almost guarantees a certain homogeneity with respect to many aspects of family background.

A second striking result was the appearance of all four classroom performance measures (cognitive-memory, convergent thinking, divergent thinking and evaluative thinking) in a single "classroom performance" factor. The evidence is that the child who is good (or bad) in one aspect of verbal output in the classroom is good (or bad) in all aspects. Perhaps a more accurate description of the situation is that some children respond regardless of the inferred style of thought called for and others do not respond.

Some evidence was found for relationships between family environment and performance on the Uses and Consequences tests. The most clear cut result was the inverse relationship between parental satisfaction with the child's behavior and breadth score on the Consequences test; a finding which suggested that perhaps productive thinking in young adolescents is enhanced when the child has internalized a "searching" norm which generalizes to a wide variety of situations. It would seem that little "productive thinking" of any kind would take place unless there were dissatisfaction with existing conditions and motivation to search for betterment. There was also some evidence for a direct relationship between parental educational-occupational status and child's breadth score on the Uses test; a finding which was interpreted as suggesting that perhaps range of experience and language facility are crucial elements in performance on the Uses test. Finally, there was a faint hint of a relationship between family size and breadth score on the Uses test.

Now we will turn to factor analysis of the data derived from families with a girl in the study. Analysis of girls' data will follow the same general plan as the analysis of boys' data; i.e., factors derived from family data are presented first followed by a second-order analysis aimed at discovery of relationships between family environment and cognitive style.

Factor Analysis of Girls' Family Data

Table 40 shows the 48 measures derived from family data which were included in the analysis, the 15 rotated factors and both per cent of total variance explained by each principal axis factor and the per cent of common factor variance explained by each Varimax Factor.

TABLE 40

Varimax Factors Derived from Families with a Girl in the Study

		I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV
1.	Father's satisfaction with instrumental activity	-05	-23	04	84	04	-01	02	-08	-04	-00	-16	-07	07	10	09
2.	Mother's satisfaction with instrumental activity	05	-05	07	80	24	-04	21	03	-06	-00	24	-05	02	-07	-24
3.	Child's perception of father's satisfaction with instrumental activity	52	01	-16	33	15	-18	04	-11	21	-14	-19	-36	37	01	-02
4.	Child's perception of mother's satisfaction with instrumental activity	72	15	03	25	09	-02	-18	-01	07	-21	-20	11	18	-16	-29
5.	Child-father communication accuracy	68	-06	-22	-08	15	-06	-04	-22	-04	03	08	-14	-17	-08	32
6.	Child-mother communication accuracy	48	05	-05	-07	45	-18	04	-21	-10	-14	02	13	-04	-35	-20
7.	Father's criticalness of child's behavior	-14	10	-05	-73	-11	-16	-04	-15	10	-01	14	-26	-11	-07	-40
8.	Mother's criticalness of child's behavior	-13	10	-05	-49	-72	-05	-19	-08	03	07	-12	-10	-06	-09	15
9.	Child's perception of father's criticalness	-84	-03	12	00	-01	08	05	04	-10	16	-00	28	-16	-02	04
10.	Child's perception of mother's criticalness	-92	-05	-04	-19	03	07	06	-06	05	03	-04	-01	-01	-00	01
11.	Father's satisfaction with social-emotional activity	13	-02	02	09	13	08	03	31	15	-03	14	29	16	-01	61
12.	Mother's satisfaction with social-emotional activity	05	02	13	00	86	00	04	13	05	-07	10	12	11	-07	14
13.	Child's perception of father's satisfaction with social-emotional activity	74	12	15	27	11	15	-07	03	00	-03	24	-03	-08	16	01
14.	Child's perception of mother's satisfaction with social-emotional activity	76	-08	13	-03	07	12	04	14	-04	08	20	17	-21	10	18
15.	Father's emphasis upon independence-granting in child-training	04	00	-04	05	-15	-10	24	-05	09	-17	11	13	04	70	05
16.	Mother's emphasis upon independence-granting in child-training	-18	21	-14	02	10	-09	15	-07	-03	-06	-10	78	12	09	09
17.	Father's emphasis upon independence in ranking of behavior choices	12	61	-15	27	-03	-12	-02	-09	-07	-05	-02	23	-05	27	-05
18.	Mother's emphasis upon independence in ranking of behavior choices	00	59	19	05	03	-07	00	17	07	-24	16	-02	23	-17	-38
19.	Mother-father agreement in ranking of behavior choices	-12	27	-10	31	33	-11	-18	-07	06	37	25	32	-05	13	-06
20.	Father-mother agreement in ranking of ten life goals for children	15	-03	-01	-05	05	00	-15	-20	09	07	82	-06	02	03	01
21.	Father's personality trait rating for self	-07	-05	46	01	12	-36	14	06	00	-07	-09	-28	03	-06	57
22.	Mother's personality trait rating for self	07	21	47	09	40	-03	-08	11	-01	10	-27	-08	-01	51	-21
23.	Father's personality trait rating for mother	06	20	75	09	19	06	08	16	-19	-04	-04	-02	-07	04	-12
24.	Mother's personality trait rating for father	-24	01	22	11	11	-78	-10	-15	02	11	03	01	10	03	08
25.	Father's personality trait rating for child	00	12	37	-03	73	00	07	-05	-04	10	-09	-09	-09	-10	19
26.	Mother's personality trait rating for child	-04	08	30	29	52	-10	-23	-05	14	21	-23	-02	-13	41	-12
27.	Father-mother role tension score	-07	16	74	08	28	-37	03	09	-11	-01	-13	-18	03	23	08
28.	Father-mother agreement on ranking of ten domestic values	00	-14	67	-11	-04	18	13	-04	-09	01	24	06	24	-28	05
29.	Marital integration score	-03	-05	91	04	11	-04	11	04	-07	-02	-02	-00	14	03	10
30.	Number of persons living in the household	-00	64	07	-00	04	-02	00	97	-01	-03	-10	-04	-00	00	07
31.	Number of children in the family	-03	04	10	01	04	-06	-04	96	-03	-02	-09	-01	-02	-02	06
32.	Number of years parents married	-04	-11	19	16	04	-06	87	03	-05	-05	-18	20	-10	05	-00
33.	Age of father in years	-15	-01	21	18	07	65	61	-12	02	03	-10	06	06	-06	05
34.	Age of mother in years	-17	06	03	05	07	29	83	-07	-07	11	09	-10	18	12	08
35.	Father's age in years at time of marriage	-18	10	08	10	03	87	05	-17	08	07	02	-09	14	-11	04
36.	Mother's age in years at time of marriage	-23	19	-20	-08	05	49	11	-14	-03	20	31	-38	38	11	09
37.	Father-Number of years of formal education completed	08	89	02	-20	01	06	-10	05	-09	06	-03	08	-05	05	01
38.	Mother-Number of years of formal education completed	00	68	12	-20	03	39	02	15	02	04	10	18	08	09	-11
39.	Father's age in years when completed formal education	17	73	-10	-10	12	22	-19	-22	10	-02	-05	-04	05	-26	17
40.	Socioeconomic Status index value of father's occupation	-12	81	13	-12	02	-11	24	10	-26	08	-07	-12	-02	03	01
41.	Number of years father has been in present occupation	04	-03	14	-13	15	02	47	06	-36	-01	-30	02	42	23	-01
42.	Number of occupations father engaged in since completed formal education	05	-46	-16	24	-05	21	23	08	41	-05	30	-01	-31	00	-06
43.	Average number of hours per week mother works at paying job	01	-06	-18	-15	19	04	-17	-04	75	02	-02	-01	21	04	09
44.	Mother-Proportion of years worked since marriage/years married	02	-05	-09	00	-05	-03	-01	-00	82	-06	07	-05	-22	04	-01
45.	Father-Frequency of attendance at PTA meetings	-04	-28	-06	-12	-18	12	03	01	59	49	-02	11	23	12	01
46.	Mother-Frequency of attendance at PTA meetings	-15	-02	-10	-09	03	06	-05	-13	-03	87	-04	-03	-05	01	-06
47.	Number of teachers father has met in person	-02	06	26	20	02	13	08	00	-00	15	05	11	67	-01	08
48.	Number of teachers mother has met in person	-04	10	14	13	-03	-08	16	13	03	73	15	-07	25	-23	08
	PER CENT OF VARIANCE	12.3	10.8	9.1	7.6	6.1	5.6	5.0	4.2	3.7	3.6	3.1	3.1	2.7	2.5	2.2
	PER CENT OF COMMON FACTOR VARIANCE	11.8	10.1	9.4	7.8	7.7	7.5	6.9	6.4	5.6	5.3	4.4	4.3	4.3	4.3	4.1

Factor I has loadings of .4 or greater on the following 8 variables:

10.	Child's perception of mother's criticalness	-.92
9.	Child's perception of father's criticalness	-.84
14.	Child's perception of mother's satisfaction with social-emotional activity	.76
13.	Child's perception of father's satisfaction with social-emotional activity	.74
4.	Child's perception of mother's satisfaction with instrumental activity	.72
5.	Child-father communication accuracy	.68
3.	Child's perception of father's satisfaction with instrumental activity	.52
6.	Child-mother communication accuracy	.48

Factor I, which explains about 12 per cent of the common factor variance, is labeled child's perception of parental satisfaction with behavior. Thus, the higher the factor score the less critical with her general behavior the child perceives the parent as being and the more generally satisfied the child perceives the parent as being. In addition, accuracy of parent-child communication will exert a modest influence in calculation of the factor score.

Factor II has loadings of .4 or more on the following 7 variables:

37.	Father-Number of years of formal education completed	.89
40.	Socioeconomic Status index value of father's occupation	.81
39.	Father's age in years when completed formal education	.73
38.	Mother-Number of years of formal education completed	.68
17.	Father's emphasis upon independence in ranking of behavior choices	.61
18.	Mother's emphasis upon independence in ranking of behavior choices	.59
42.	Number of occupations father engaged in since completed formal education	-.46

Factor II, which explains about 10 per cent of the common factor variance, is labeled educated-upper status-autonomy inducing home environment. Thus the higher the factor score the greater the parental education, the higher the status of the father's occupation and the greater the parental emphasis upon social and intellectual autonomy in ranking of behavior choices. The modest negative loading on Item 42 (occupations father engaged in) can be explained by the observation that those in high status (professional) occupations usually do not shift occupations as often as persons in lower status jobs.

Factor III has loadings of .4 or more on the following 6 variables:

29.	Marital integration score..........................	.91
23.	Father's personality trait rating for mother.......	.75
27.	Father-mother role tension score...................	.74
28.	Father-mother agreement on ranking of ten domestic values	.67
22.	Mother's personality trait rating for self.........	.47
21.	Father's personality trait rating for self.........	.46

Factor III, which explains about 9 per cent of the common factor variance, is quite clearly the *marital integration* factor. All significant loadings are on either the marital integration score or on a component of the marital integration index. Thus, the higher the factor score the greater the degree of integration in the parents' marriage.

Factor IV has loadings of .4 or greater on the following 4 variables:

1.	Father's satisfaction with instrumental activity....	.84
2.	Mother's satisfaction with instrumental activity....	.80
7.	Father's criticalness of child's behavior...........	-.73
8.	Mother's criticalness of child's behavior...........	-.49

Factor IV explains about 8 per cent of the common factor variance. Perhaps the best label for the factor is *parental satisfaction with child's instrumental behavior*. However, the fairly large loading on Item 7 (father's criticalness) will also exert some influence on the factor score and must be kept in mind. At any rate, the higher the factor score the greater the parental satisfaction with instrumental behavior and the less critical the father (and to some extent the mother) of the child's general behavior.

Factor V has loadings of .4 or greater on the following 6 variables:

12.	Mother's satisfaction with social-emotional activity	.86
25.	Father's personality trait rating for child	.73
8.	Mother's criticalness of child's behavior	-.72
26.	Mother's personality trait rating for child	.52
6.	Child-mother communication accuracy	.45
22.	Mother's personality trait rating for self	.40

Factor V, which explains about 8 per cent of the common factor variance, is labeled *parental acceptance of daughter's feminine role performance*. The higher the factor score the more satisfied the mother with daughter's social-emotional activity, the greater the tendency for both parents to rate the daughter as *not* possessing negative personality traits, and the greater the mother's satisfaction with the child's general behavior (low criticalness). The variables with significant loadings on Factor V seem to cluster around the general realm of the child's personal and social adjustment (showing affection toward parents and friends, caring about what happens to people, not possessing negative personality traits.) Parsons and Bales (1955) and others have argued that in American society the woman tends to be the social-emotional "expert;" i.e., a major component of the feminine role is the establishment and maintenance of congenial interpersonal relations. Thus the labeling of the factor in terms of feminine role performance.

Factor VI has loadings of .4 or more on the following 4 variables:

35.	Father's age in years at time of marriage	.87
24.	Mother's personality trait rating for father	-.78
33.	Age of father in years	.65
36.	Mother's age in years at time of marriage	.49

Factor VI explains about 8 per cent of the common factor variance. It is a difficult factor to label. It would seem that the later the marriage the greater the perceived role tension on the part of the mother with respect to the father. Perhaps the best label is *age at marriage-maternal role tension.* Thus, the higher the factor score the older the parents at time of marriage, the older the father at time of study and the greater the tendency for the mother to view the father as possessing negative personality traits.

Factor VII has loadings of .4 or more on the following 4 variables:

32.	Number of years parents married....................	.87
34.	Age of mother in years.............................	.83
33.	Age of father in years.............................	.61
41.	Number of years father has been in present occupation..................................	.47

Factor VII, which explains about 7 per cent of the common factor variance, is labeled marital stability. The higher the factor score the longer the parents have been married to each other, the older the parents and the longer the father has been engaged in his present occupation.

Factor VIII has loadings of .4 or greater on the following 2 variables:

30.	Number of persons living in the household...........	.97
31.	Number of children in the family....................	.96

Factor VIII, which explains about 6 per cent of the common factor variance, is labeled the size of family factor. The higher the factor score the greater the number of persons living in the household and the greater the number of children in the family.

Factor IX has loadings of .4 or more on the following 4 variables:

44.	Mother - Proportion of years worked since marriage/ years married..................................	.82
43.	Average number of hours per week mother works at paying job....................................	.75
45.	Father - Frequency of attendance at PTA meetings...	.59
42.	Number of occupations father engaged in since completed formal education......................	.41

Factor IX explains about 6 per cent of the common factor variance. The variables pertaining to maternal employment will have the major influence on the factor score. Therefore, the factor is labeled mother's employment. The higher the factor score the greater the proportion of her married years the mother has been employed for at least two months of the year, the greater the average hours per week the mother is employed, the more frequent the father's attendance at PTA meetings and the greater the number of different jobs held by the father since completion of formal education. The factor hints at a family situation in which the mother acts to compensate for paternal deficiency as breadwinner and in which the father, in turn, compensates for maternal employment by taking on duties usually assumed by the mother (attendance at PTA meetings).

Factor X has loadings of .4 or more on the following 3 variables:

46. Mother - Frequency of attendance at PTA meetings... .87
48. Number of child's teachers mother has met and spoken to in person............................ .73
45. Father - Frequency of attendance at PTA meetings... .49

Factor X, which explains about 5 per cent of the common factor variance, is labeled parental involvement with school. Thus, the higher the factor score the more frequent the parental attendance at PTA meetings and the greater the number of child's teachers that the mother has met and spoken to in person.

Factor XI has loadings of .4 or more on the following variable:

20. Father-mother agreement in ranking of ten life goals for children............................ .82

Factor XI, which explains about 4 per cent of the common factor variance, is labeled parental agreement on life goals for child. The higher the factor score the greater the degree of parental agreement.

Factor XII has loadings of .4 or more on the following variable:

16. Mother's emphasis upon independence-granting as opposed to achievement-inducing in child-training.................................... .78

Factor XII, which explains about 4 per cent of the common factor variance, is labeled mother's emphasis upon independence-granting in child-training. Thus, the higher the factor score the greater the maternal emphasis upon independence-granting as opposed to achievement-inducing in child-training.

Factor XIII has loadings of .4 or greater on the following two variables:

47.	Number of child's teachers father has met and spoken to in person	.67
41.	Number of years father has been in present occupation	.42

Factor XIII explains about 4 per cent of the common factor variance. It is labeled father's contact with child's teachers. The higher the factor score the greater the number of child's teachers the father has met and the longer the father has been engaged in his present occupation. The modest loading on father's years in present occupation may be due to the following circumstances: (a) Many of the children in the study attend a university high school, (b) many of the fathers of the children are professors at the university and (c) university teachers are not especially prone to switch occupations. The university professors are likely to have contact with the teacher's at the university high school -- thus, possibly, the modest loading on Variable 41.

Factor XIV has loadings of .4 or more on the following 3 variables:

15.	Father's emphasis upon independence-granting as opposed to achievement-inducing in child-training	.70
22.	Mother's personality trait rating for self	.51
26.	Mother's personality trait rating for child	.41

Factor XIV, which explains about 4 per cent of the common factor variance, is labeled father's emphasis upon independence-granting - mother's self acceptance. Thus, the higher the factor score, the greater the father's emphasis upon independence-granting as opposed to achievement-inducing in child-training, the greater the tendency of the mother to see herself as not possessing negative personality traits and (to a slight extent) the less likely the mother to perceive her daughter as possessing negative personality traits.

Factor XV has loadings of .4 or greater on the following 3 variables:

11.	Father's satisfaction with social-emotional activity	.61
21.	Father's personality trait rating for self	.57
7.	Father's criticalness of child's behavior	-.40

Factor XV explains about 4 per cent of the common factor variance. It is labeled father's acceptance of self and of daughter. The higher the factor score the greater the father's satisfaction with the child's social-emotional behavior, the less likely the father to see himself as possessing negative personality traits and the less critical the father of the child's general behavior as represented in the 22 item activities checklist.

The fifteen Varimax factors derived from data from 56 families with a girl in the study have been set forth and described. In the section to follow second-order factors derived partly from factor scores obtained in the preceding analysis and from classroom performance data and other information relating to cognitive ability are described.

Second Order Factor Analysis of Girls' Data

As for the analyses of the boys' data, the purpose of the second-order factor analyses of the girls' data is to discover the relationships which obtain between family environment (as represented by the fifteen individual factor scores for each family) and the child's verbal performance in the classroom, her scores on paper and pencil tests of divergent thinking ability, her rating of concepts included in a semantic differential instrument and her teacher's rating of her cognitive ability and her sociability.

There were 11 girls represented in the factor analysis of the family data for whom no classroom performance data were available. Therefore, the factor scores for the families of these children were omitted from the second-order factor analyses. Omission of the 11 girls left 45 (56 minus 11) girls represented in the second-order analyses.

As for the boys, two second-order factor analyses were performed for the girls. Two analyses were performed to take advantage of the fact that for 25 of the 45 girls there were classroom performance data available from more than one classroom setting. For these 25 girls, the new sets of classroom data were used in the second (Group B) factor analysis.

For 11 of the 25 girls with two sets of classroom data the Group A to Group B shift involved moving from a social science class to a biological science class one year later. For the remaining 14 girls, the Group A to Group B shift involved moving from a general science class to an English class one year later.

When available, other new data were introduced into the Group B analysis. Ten of the 25 girls had new Uses, Consequences, Semantic Differential and Teacher Rating data from the second classroom setting. For 2 of the students only the classroom performance data were new. For 12 of the students the only new data available were Semantic Differential data. Finally, for one student only new teacher rating data were available.

For the 20 girls without new classroom performance data, exactly the same data were used in the Group B analysis as were used in the Group A analysis.

Once again, as for the boys, oblique factors are presented for the girls in the form of the reference vector structure. And again only those factors which give evidence of a relationship between family environment and cognitive style are interpreted. Finally, to facilitate discussion the Group A and Group B factors are described and interpreted together.

Table 41 gives the reference vector structure derived from Group A data and Table 42 gives the reference vector structure derived from Group B data.

Factor I-A, which has no counterpart among the Group B factors, has loadings of .4 or greater on the following 3 variables:

2.	Family Factor II: Educated-upper status-autonomy inducing home environment	-.75
31.	Semantic differential: School	-.70
25.	Semantic differential: Work	-.47

Factor I-A is of interest here because of the evidence of the relationship between family environment and the child's rating of the "school" concept. The factor loadings suggest that the more well-educated the parents and the higher the status of the father's occupation the more favorable the girl's rating of the semantic differential concept of school. Considering the sample of families involved here, this factor is not surprising. The "upper status" families in the sample include a large proportion of university professors, physicians and dentists. Coming from homes wherein education, status, and prestige are so closely allied it seems plausible that the girls would tend to have a more favorable view of "school" than girls from less advantaged homes. The factor also serves as another reminder of the potent influence of the home and neighborhood environment upon the values and attitudes and feelings of children.

Factor II-A, which has no direct counterpart among the Group B factors, has loadings of .4 or greater on the following two variables:

8.	Family Factor VIII: Size of family	-.86
17.	Classroom performance: Divergent thinking	-.44

While of obvious interest here, Factor II-A is difficult to interpret. Further information would be needed before any really intelligent guess could be made regarding the underlying dimension which ties the variables

TABLE 41

Girls Group A: Reference Vector Structure

		I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII
1.	Family Factor I: Child's perception of parental satisfaction with behavior	117	-011	-047	366	059	125	086	115	243	026	093	243	181
2.	Family Factor II: Educated-upper status-autonomy inducing home environment	-748	047	030	270	178	131	-202	064	050	-067	-058	-439	-056
3.	Family Factor III: Marital integration	-112	080	-158	122	802	036	143	045	111	091	068	-104	216
4.	Family Factor IV: Parental satisfaction with child's instrumental behavior	-357	064	005	-144	-179	-168	246	151	060	-040	046	-111	220
5.	Family Factor V: Parental acceptance of daughter's feminine role performance	111	-029	-041	-046	213	106	767	-156	058	065	-246	092	-162
6.	Family Factor VI: Age at marriage: Maternal role tension	215	-101	277	-008	-092	-780	-110	-075	-017	145	-089	209	-093
7.	Family Factor VII: Marital stability	026	161	-173	-161	059	-052	-140	873	052	-126	101	014	409
8.	Family Factor VIII: Size of family	075	-858	-057	122	-000	-157	-076	-120	-054	-217	-007	-174	-361
9.	Family Factor IX: Mother's employment	122	066	016	-016	-089	-004	-061	-086	-871	137	146	-048	-334
10.	Family Factor X: Parental involvement with school	-037	297	-057	-025	066	-224	065	-122	-185	924	-055	313	264
11.	Family Factor XI: Parental agreement on life goals for child	002	075	772	009	-023	-243	-037	-098	074	-023	069	338	032
12.	Family Factor XII: Mother's emphasis on independence-granting in child-training	-028	033	050	-155	087	-006	-270	114	-181	-053	911	-037	325
13.	Family Factor XIII: Father's contact with child's teachers	-035	096	-251	123	007	-192	-134	-141	129	-140	043	030	-235
14.	Family Factor XIV: Father's emphasis on independence-granting: Mother's self-acceptance	-085	-126	457	150	-250	-022	-018	-124	-106	-056	091	-185	-210
15.	Family Factor XV: Father's acceptance of self and of daughter	013	152	-051	-816	-087	056	030	152	-016	022	145	-184	104
16.	Classroom performance: Cognitive-memory	-082	-365	010	017	-053	-035	000	-069	059	-062	098	-102	-410
17.	Classroom performance: Divergent thinking	-063	-440	144	-033	-165	-028	085	106	139	027	-218	-096	-213
18.	Classroom performance: Convergent thinking	-032	036	-039	-097	-030	049	119	-072	-130	224	298	040	-184
19.	Classroom performance: Evaluative thinking	-003	-160	032	-136	-035	058	024	108	170	-069	-020	-000	-274
20.	Uses test: Breadth score	086	-060	104	147	034	-625	-012	357	097	143	211	223	252
21.	Consequences test: Breadth score	-008	210	-188	009	-261	-014	-039	208	-258	018	-294	-032	-387
22.	Semantic differential: Mother	-022	-223	077	-011	-023	-009	024	-072	-143	-208	166	249	-234
23.	Semantic differential: Father	-042	049	235	116	076	-142	-160	005	033	214	024	475	030
24.	Semantic differential: Student	126	145	181	-066	-089	260	-113	184	-044	-028	-040	365	045
25.	Semantic differential: Work	-472	049	-044	199	-034	078	093	-081	106	073	-092	107	-058
26.	Semantic differential: Competition	-000	-205	-266	-065	268	-098	125	174	-178	082	-086	179	-196
27.	Semantic differential: Success	160	224	-103	086	-110	025	312	-040	-002	-153	121	331	022
28.	Semantic differential: Love	006	-090	-126	253	-127	294	008	-019	-276	082	069	241	-124
29.	Semantic differential: Faith	145	177	282	111	-034	-069	459	036	037	000	-107	572	125
30.	Semantic differential: Imagination	031	-017	002	-269	-086	012	103	-106	288	001	-067	341	-021
31.	Semantic differential: School	-702	088	-001	-313	032	182	-013	-112	094	112	146	-338	050
32.	Teacher rating: Cognitive ability	190	-277	-305	047	-121	131	-068	-006	143	133	124	060	375
33.	Teacher rating: Sociability	-070	-068	-283	032	-517	-072	-333	-024	215	116	-071	014	116

TABLE 42

Girls Group B: Reference Vector Structure

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII
1. Family Factor I: Child's perception of parental satisfaction with behavior	-110	011	-010	035	-275	-128	232	194	-199	165	125	289	-227
2. Family Factor II; Educated-upper status-autonomy inducing home environment	087	-058	-094	042	-301	086	-157	048	189	-204	315	-104	289
3. Family Factor III: Marital integration	070	-846	-100	-023	039	-223	150	149	170	049	052	-223	259
4. Family Factor IV: Parental satisfaction with child's instrumental behavior	105	207	-014	-049	196	835	261	034	018	019	014	-131	-271
5. Family Factor V: Parental acceptance of daughter's feminine role performance	-053	-140	174	-147	-007	181	818	176	100	-207	053	272	-245
6. Family Factor VI: Age at marriage: Maternal role tension	-155	118	018	230	-028	-070	-113	007	038	-129	-811	-119	-173
7. Family Factor VII: Marital stability	265	-125	-908	-154	124	026	-244	-003	-098	108	-032	-027	271
8. Family Factor VIII: Size of family	228	-038	214	-020	-072	-007	-156	072	-412	-017	-151	-003	262
9. Family Factor IX: Mother's employment	-088	144	006	-083	-070	-071	-218	-864	013	085	023	089	-082
10. Family Factor X: Parental involvement with school	-832	-059	194	-112	024	-077	001	-097	-166	002	-129	374	-319
11. Family Factor XI: Parental agreement on life goals for child	148	006	112	887	082	-068	-189	075	279	072	-152	-085	198
12. Family Factor XII: Mother's emphasis on independence-granting in child-training	-013	-028	-087	059	050	000	-267	-080	026	872	054	199	-144
13. Family Factor XIII: Father's contact with child's teachers	003	-137	193	-053	-019	091	-023	327	623	279	020	041	-291
14. Family Factor XIV: Father's emphasis on independence-granting: Mother's self-acceptance	162	269	-025	249	-157	082	173	001	083	091	-009	328	104
15. Family Factor XV: Father's acceptance of self and of daughter	006	-047	-121	090	879	195	-010	095	045	043	076	143	285
16. Classroom performance: Cognitive-memory	-001	102	040	010	128	018	180	012	221	007	081	685	011
17. Classroom performance: Divergent thinking	-063	071	-169	-031	-016	-075	059	155	-234	-200	-049	507	290
18. Classroom performance: Convergent thinking	-2[illegible]	174	045	-094	051	-085	198	-115	120	210	067	859	-255
19. Classroom performance: Evaluative thinking	-059	-098	-125	024	124	-153	-171	-021	200	036	-023	523	179
20. Uses test: Breadth score	015	-133	-206	042	-139	288	059	022	009	408	-541	054	-324
21. Consequences test: Breadth score	-064	081	-078	-055	-065	161	013	-334	498	-229	-154	183	-239
22. Semantic differential: Mother	176	029	100	-153	-184	-043	-021	-063	069	011	-020	050	-352
23. Semantic differential: Father	-097	-048	026	228	-129	-136	-269	066	102	029	-020	080	-175
24. Semantic differential: Student	076	174	248	017	-085	-173	-129	057	053	-001	-081	-045	-288
25. Semantic differential: Work	262	023	-050	115	021	089	-132	-049	-043	058	341	046	006
26. Semantic differential: Competition	186	-109	-110	-332	-058	-020	245	061	043	-207	-091	074	-301
27. Semantic differential: Success	-082	-261	-041	045	-079	091	162	-128	-043	020	103	-061	-329
28. Semantic differential: Love	109	267	115	-058	050	096	-106	-174	-075	108	100	040	-328
29. Semantic differential: Faith	034	026	049	446	-033	116	164	050	053	-147	-147	-134	-274
30. Semantic differential: Imagination	050	137	-031	016	179	-114	-011	379	048	-098	-012	048	-161
31. Semantic differential: School	-008	-147	-004	195	250	128	005	-036	-139	-080	033	093	-027
32. Teacher rating: Cognitive ability	-195	143	-069	-324	-037	075	-110	054	-800	043	020	-186	-038
33. Teacher rating: Sociability	-274	302	-021	-097	-027	445	-145	275	-085	-021	-023	-011	-307

of family size and divergent thinking performance together. Perhaps the factor reflects nothing more than that girls from large families have had to learn to be more agressive at home and consequently feel more at home in a classroom in verbal competition with other children.

Factor III-A has no mate among the Group B factors. The factor carries sizable loadings on Family Factor XI - Parental agreement on life goals for child (.77) and on Family Factor XIV - Father's emphasis upon independence-granting: Mother's self-acceptance (.46). Factor III-A is of no interest here.

Factor IV-A and Factor V-B are similar in that both have a single sizable loading on Family Factor XV - Father's acceptance of self and of daughter (-.82 and .88 respectively). Neither factor is of interest here.

Factor V-A, which has no counterpart among the Group B factors, has loadings of .4 or more on the following two variables:

3. Family Factor III: Marital integration............. .80
33. Teacher rating: Sociability....................... -.52

Factor V-A is of interest in that is suggests a relationship between family environment and teacher's judgement as to how well the child gets along with other students. It may be recalled that teacher ratings were coded such that the higher the numerical value of the rating the less favorable the rating. Thus, the negative loading on Variable 33 indicates a positive relationship between marital integration of the parents and teacher rating of the child's sociability. It is hardly surprising that girls from homes in which the parents are happily married should themselves be adept at getting along with their peers. This factor also points to the influence of home environment upon peer group relations with all of the implications of such relations for success in school.

Factor VI-A is similar to Factor XI-B. Both factors have loadings of .4 or greater on the following 2 variables:

	VI-A	XI-B
6. Family Factor VI: Age at marriage-Maternal role tension..............................	-.78	-.81
20. Uses test: Breadth score......................	-.63	-.54

While of obvious interest, Factors VI-A and XI-B are impossible to interpret without further data. The underlying dimension which ties together parental age at marriage, age of father at time of study, and mother's personality trait rating of father with girls' performance on the Uses test is obscure.

Factor VII-A has no mate among the Group B factors. This factor has sizable loadings on Family Factor V - Parental acceptance of daughter's feminine role performance (.77) and on child's rating of the semantic differential concept Faith (.46). Factor VII-A is of no particular interest here.

Factor VIII-A and Factor II-B are similar. Each has a single sizable loading on Family Factor VII - Marital stability (.87 and -.85 respectively). Neither factor will be discussed here.

Factor IX-A has a counterpart in Factor VIII-B. Each factor has a single sizable loading on Family Factor IX - Mother's employment (-.87 and -.86 respectively). Neither factor is of interest.

Factor X-A and Factor I-B are similar in that each has a single large loading on Family Factor X - Parental involvement with school (.92 and -.83 respectively). Again, neither factor is of interest here.

Factor XI-A has no counterpart among Group B factors. With its single large loading on Family Factor XII - Mother's emphasis upon independence-granting in child-training (.91) Factor XI-A is of no interest.

Factor XII-A has no mate among Group B factors and is of little interest here. Factor XII-A has sizable loadings on the semantic differential concepts of Faith (.57) and Father (.48) and on Family Factor II - (-.44).

Factor XIII-A has no counterpart among the Group B factors. Factor XIII-A has loadings of .4 or more on the following 2 variables:

16.	Classroom performance: Cognitive-memory...........	-.41
7.	Family Factor VII; Marital stability..............	.41

Factor XIII-A is of obvious interest here but it is impossible to interpret adequately. It is not clear why the number of years the parents have been married and the age of the parents should be negatively related to the child's cognitive-memory performance in the classroom. Further information would be needed to discover the nature of the underlying dimension which ties together the two variables listed above.

Thus far, all of the Group A factors and five of the Group B factors have been listed and discussed. Now attention will be turned to the eight remaining Group B factors which have not been listed as yet.

Factor III-B, with its single large loading on Family Factor VII - Marital stability (-.91), is of little interest here.

Factor IV-B, with its sizable loadings on Family Factor XI - Parental agreement on life goals for child (.89) and on semantic differential concept of Faith (.45), is also of little interest here.

Factor VI-B has loadings of .4 or more on the following two variables:

4.	Family Factor IV: Parental satisfaction with child's instrumental behavior..............................	.84
33.	Teacher rating: Sociability.......................	.45

The interesting thing about Factor VI-B is that it suggests a negative relationship between parental satisfaction with girls' instrumental behavior and teacher's rating of the girls' sociability. (It may be recalled that the teacher ratings were coded such that the higher the numerical value of the rating the less favorable the rating.) Perhaps the girls who are especially competent (from their parents' point of view) in instrumental behavior are not especially competent (from the teacher's point of view) in social-emotional behavior. The girl who is especially competent in task performance might not be oriented toward the establishment and maintenance of congenial interpersonal relations. Given the cultural bias that girls be especially adept at interpersonal relations, even a moderately good performance in this area might receive a low rating from a culturally biased observer.

Factor VII-B, with a single sizable loading on Family Factor V - Parental acceptance of daughter's feminine role performance (.82), is of no interest here.

Factor IX-B has loadings of .4 or greater on the following 4 variables:

32.	Teacher rating: Cognitive ability	-.80
13.	Family Factor XIII: Father's contact with child's teachers	.62
21.	Consequences test: Breadth score	.50
8.	Family Factor VIII: Size of family	-.41

Of primary interest in Factor IX-B are the variables dealing with teacher's rating of cognitive ability, father's contact with child's teachers and breadth score on the Consequences test. First, it is of interest to note the positive relationship between Consequences test score and teacher's rating of cognitive ability; an indication that for the girls in this sample performance on a paper and pencil test of divergent thinking ability and all-around scholastic performance are perhaps related. No such relationship was noted for the boys. Of primary interest, however, is the relationship between father's contact with child's teachers and teacher's rating of cognitive ability. There are two possible explanations for the positive relationship between the two variables: (a) Some of the girls were attending a university high school at the time of the study and some of the fathers of the girls are university professors. University professors are more likely to have contact with the child's teachers than are other fathers. Thus the relationship between father's contact with teachers and rating of cognitive ability might be due to the stress on academic achievement which is likely in a home where the father is a university professor. (b) An alternative explanation is that frequent contact with the child's teachers is a symptom of parental reinforcement for academic achievement; i.e., the father who is really interested in his daughter's progress in school will make it a point to know her teachers. Of course, it is possible that both "explanations" given for the positive relationship between father's contact with teachers and teacher rating of cognitive ability have some validity here. In either case, parental reinforcement for academic striving would seem to be operating.

Factor X-B has loadings of .4 or more on the following 2 variables:

12.	Family Factor XII: Mother's emphasis upon independence-granting in child-training.........	.87
20.	Uses test: Breadth score.........................	.41

The explanation for the positive association between the two variables listed above may be that mother's who grant their daughter's a good deal of independence also grant them a broader range of experience during formative years than do mothers who keep a tighter rein. As was argued in discussion of boys' factors, range of experience would seem to be a crucial element in determining performance on the Uses test.

Factor XII-B has sizable loadings on all of the classroom performance measures: Convergent thinking (.86), Cognitive-memory (.69), Evaluative thinking (.52) and Divergent thinking (.51). Factor XII-B is clearly the classroom performance factor.

The last of the girls' factors, Factor XIII-B, has no loadings of .4 or greater on any variable. The highest loadings are all on semantic differential concepts: Mother (-.35), Success (-.33) and Love (-.33).

Summary of Results: Girls' Second-Order Factor Analyses

Factor analysis of the girls' data revealed one possible link between family environment and classroom performance -- the positive relationship between size of family and girl's performance in divergent thinking. It was hypothesized that girls from larger families learn to be more aggressive in competing with siblings for parental time and attention than do girls from smaller families. Perhaps the girl from a larger family would then do better in competing with classmates for the teacher's attention.

Fathers' contact with the child's teachers appeared to be positively related to teachers' ratings of cognitive ability of the child. Although two alternative explanations were presented for the observed relationship, both explanations assumed that paternal reinforcement of daughter's academic striving had some influence upon academic performance and, hence, teachers' ratings. It is of interest that it is the fathers' contact with the teachers that seems to make a difference; not mothers' contact.

A factor of interest was one which suggested a positive relationship between mother's emphasis upon independence-granting over achievement-inducing in child-training and girls performance on the Uses test. It was argued that girls whose mothers grant them greater independence than do other mothers thereby gain a broader range of experience. Range of available experience would seem to be a crucial element influencing performance on the Uses test.

Also of interest here was the tentative finding that girls from homes wherein the parents are well-educated and the father has a high status job rate the semantic differential concept of school more favorably than do girls from less advantaged homes. In view of the fact that some of the girls in the sample who come from "advantaged" homes have university professors for fathers, the finding is not especially surprising.

Two other findings of interest remain to be noted. First, there was evidence of a positive relationship between marital integration of the parents and teachers' rating of girls' sociability. Second, there was evidence of a negative relationship between teachers' rating of girls' sociability and parental satisfaction with the child's instrumental activity. In the first instance, it seems plausible that a girl whose parents are happy in their marriage would, with such behavior models available, do well in terms of sociability. In the second instance, the relationship is not quite so obvious. It may be that girls who are especially competent in task performance (instrumental activity) are not as "feminine" in their general behavior and not as concerned with informal interpersonal relations. Since norms of the American middle-class seem to dictate that girls be adept in interpersonal relations, a girl who is more concerned with getting things done than in getting along with others might well be rated low in sociability with peers by a culturally conditioned observer.

As was the case for the boys, there was little evidence of linkage between girls' family environment and verbal performance in the classroom. And, as was the case for the boys, it is possible that the relative homogeneity of the home environments of the girls accounts for the paucity of evidence.

5

SUMMARY AND DISCUSSION: FACTOR ANALYSIS RESULTS FOR BOYS AND GIRLS DATA

What evidence is there of relationships between family environment and the child's cognitive ability as measured by verbal output in the classroom, scores on Uses and Consequences tests and teachers' ratings of cognitive ability? What suggestions and hypotheses for future research can be gleaned from the evidence uncovered here? Do the links between family and cognitive ability measures seem to differ for boys and girls?

Below each finding of interest is listed and briefly discussed in terms of the three questions posed in the preceding paragraph.

1. For boys, the greater the parental dissatisfaction with general behavior (both instrumental and social-emotional) the higher the breadth score on the Consequences test. When parents are not satisfied with a child's behavior they tend to stimulate the child to search for alternative modes of behavior. If the family is essentially middle-class in ethos (most of the families in the study can be considered middle-class), they will, according to Kohn (1963), expect the child to "internalize" norms regarding proper conduct. Perhaps the parents who are especially critical of the boy's conduct have relatively high standards and would then expect that the child would continue to search for new patterns of behavior which conform to his continuing maturity. Further, according to Kohn, middle-class parents expect self-direction from their children. Thus, it may be that the middle-class child with critical parents has internalized a kind of "searching" norm which leads him to seek and evaluate new patterns of behavior as he grows older; a seeking process which he may be permitted to carry out more or less independently of strict parental monitoring. This could be a kind of socialization by the "discovery method." It is possible that the "searching" norm could generalize to a wide variety of

situations; including the writing of answers to a Consequences test. (Still, an alternative explanation is available: Perhaps boys with critical parents have learned to closely evaluate the possible consequences of each act before executing the act. Such practice in anticipating consequences of acts would be good training for a Consequences test.) The finding suggests that, for boys, it may not be the permissive parent who produces the "creative" thinker but the parent who puts forth standards of conduct and allows the child some initiative in discovering ways to conform to the standards. Why did not the same finding appear for girls? Perhaps it is because girls tend to be "oversocialized" and require not more standards of conduct but fewer if they are to develope the capacity to think productively.

2. For boys, the higher the parental educational-occupational status the greater the breadth score on the Uses test. The above finding was explained on the basis of range of general experience and language facility available to the child. Children from high status families in which the parents are very well educated are likely to have gained, through travel and reading, a broader range of experience and greater language facility than children of the same age from slightly less advantaged homes. Range of available experience and language facility would seem to be crucial elements in performance on the Uses test. But why did not the same finding appear for the girls in the study? Perhaps because of the difference between the amounts of freedom to explore and experience granted generally to boys and girls. If boys in general are allowed more freedom than girls, then having economically secure and well-educated parents permits them to make the most of the freedom. If, however, parental restrictions on girls are generally greater, then an advantaged home might not necessarily represent a chance for broader range of experience.

3. For girls, the larger the family the better the divergent thinking performance in the classroom. It was hypothesized that girls from large families have learned to compete with siblings for rights and living space and parental favors to a greater extent than girls from smaller families. Good classroom performance entails competition with peers for the teacher's attention. Thus, the girl from a large family would have an inherent edge in the rough and tumble of the classroom. The question arises as to why the same finding failed to appear in analysis of boys' data. A very tentative answer is that the general level of competitiveness is higher in boys than in girls, regardless of size of family. Therefore, size of family would have less influence on level of competitiveness exhibited by boys.

4. For girls, the greater the number of the child's teachers that the father had met and spoken to in person the higher the teacher's rating of the child's cognitive ability. It was assumed that paternal contact with the child's teachers demonstrated paternal interest in the child's academic performance. A high level of paternal interest would, in turn, suggest that daughter was receiving reinforcement from father to do well academically. But why is father's contact with teachers crucial and not mother's contact with teachers? There are two possible answers. First, most mothers have more free time during the day than fathers and, therefore, there might be less variation in frequency of mother's contact than in frequency of father's contact. What frequent father contacts with teachers might signal is a special interest in daughter's academic achievement. Second, it is generally agreed that academic achievement is still a primarily male domain. Perhaps reinforcement from father is then more potent than reinforcement from mother; i.e., there is more to be gained from a

recommendation from a "club member" than from an outsider. Why didn't the same finding appear for boys? It is difficult to know. It may be that "gifted" boys, such as the boys in the study, are all about equally motivated to do well academically with relatively little variation in strength of parental reinforcement.

5. For girls, the greater the mother's emphasis upon independence-granting as opposed to achievement-inducing in child-training the higher the child's breadth score on the Uses test. It was assumed that the broader the range of experience the better the performance on the Uses test, other things being equal. It would seem plausible that girls whose mothers allowed them relatively more independence to explore surroundings and decide things for themselves would have gained a broader range of experience than more sheltered girls. Why didn't the same finding appear for the boys? Perhaps because boys are generally less restricted in their activities than are girls and, perhaps, suffer from too much rather than too little "freedom."

The preceding findings and interpretations stand as suggestions for future research into the relationship between family environment and cognitive abilities of children.

There were other findings which were of interest inasmuch as they hinted at relationships between family environment and either attitudes or performances which are of potential significance for performance in school.

6. For boys, the older the parents at time of marriage and the older the parents at time of study the less favorable the child's rating of the semantic differential concept of Competition. It was hypothesized that either current age of parents or age at which parents were married is related to parental attitudes toward competition and that parental attitudes

are communicated to the child. The finding suggests investigation of the parent-child age disparity and the possible effects of relatively late marriage upon children.

7. For *girls*, the higher the educational-occupational status of the parents the more favorable the child's rating of the semantic differential concept of School. While not surprising, the above finding underlines the importance of family and neighborhood milieu with respect to children's attitudes toward institutions.

8. For *girls*, the higher the degree of marital integration of the parents the more favorable the teacher's rating of the child's sociability. While not particularly surprising, this finding suggests that the quality of interpersonal relations in the family milieu effects the quality of girls' interpersonal relations with peers in the school setting.

9. For *girls*, the greater the degree of parental satisfaction with the child's performance of instrumental activities the less favorable the teacher's rating of the child's sociability. The finding suggests that girls who are perhaps especially competent in task performance may be viewed by some observers as not fulfilling the norm of competence in interpersonal relations expected of girls. It might be interesting to explore the influence of general competence in instrumental activity upon the scholastic performance of girls.

Certain general trends in the factor analysis results are of interest. For example, an especially clear-cut "classroom performance" factor emerged for the boys in which there were significant loadings on all four of the aspects of verbal output in the classroom. For the girls, on the other hand, the evidence of existence of a "classroom performance" factor was not quite so clear-cut; suggesting that girls might tend to specialize in their verbal output to a greater extent than boys. It is possible that the greater pressure upon boys to excel academically leads them to attempt to either be good in all aspects of cognitive performance or to remain silent in the classroom. The smaller amount of pressure upon girls to excel academically may leave them more freedom in expressing individual differences in cognitive competence, at least in terms of volume of verbal output in the classroom.

Finally, a disappointing trend was the general lack of evidence of relationships between family environment and classroom performance. It is suggested that the relative homogeneity in family background accounts for the paucity of evidence concerning such relationships. Perhaps a more thorough analysis of quality of interpersonal relations within the family would have resulted in more clear-cut evidence of association between family environment and cognitive performance in the classroom setting.

In the section to follow, the relationship between parental emphasis upon achievement-inducing and upon independence-granting in child-training and certain aspects of classroom performance is examined.

Parental Emphasis Upon Achievement-Inducing and Independence-Granting and Child's Classroom Performance

The reader may recall that the parental AI/IG ratio included in the factor analysis data suffered from ambiguity as a measure. Therefore, it was decided to eliminate some of the ambiguity inherent in the AI/IG ratio by returning to the mean AI and IG ranks which had been computed for each parent. The procedure followed involved splitting each distribution of mean AI ranks (one for boys and one for girls) and each distribution of mean IG ranks at the median and then classifying each parent according to whether he or she was above or below the median mean rank for each distribution. Thus, each parent was classified as high AI-high IG, high AI-low IG, low AI-high IG or low AI-low IG.

The classroom performance variables of total expressiveness and divergent production were chosen as the independent variables in the analysis. Total expressiveness was expressed as the sum of all of the separate cognitive-memory, divergent-thinking, convergent thinking and evaluative thinking utterances of the child over five class sessions. Utterances classified in the Routine category were not included in the total expressiveness measure. Divergent thinking, on the other hand, was expressed in terms of the proportion of divergent thinking utterances made by the individual child of the total number of divergent thinking utterances made by all of the children over the five class sessions in a particular class setting.

In terms of the factor analysis data, the classroom settings used as sources for classroom performance data were the "Group A" settings. The children included in this analysis are the same as those included in the second-order factor analysis of the family and classroom performance data.

Table 43 gives the essential results of the first set of analyses. For these analyses, simultaneous control was exerted over parental classification on AI and IG. The object, then, was to test for differences in classroom performance scores for all four sub-groups of parents simultaneously. The mean scores reported in Table 43 and succeeding tables do not enter into the tests of significance of differences but are presented to show trends in the data.

The results of interest in Table 43 are as follows:

TABLE 43

Parental Emphasis upon Achievement-Inducing and Independence-Granting and Child's Total Expressiveness and Divergent Production in the Classroom: Mean Scores and Tests of Significance

Sex of Parent, Sex of Child and Classroom Performance Measure	Emphasis Upon Achievement-Inducing and Independence-Granting									
	High AI and High IG		High AI and Low IG		Low AI and High IG		Low AI and Low IG		Kruskal-Wallis Test:	
	N	Mean Score	N	Mean Score	N	Mean Score	N	Mean Score	H Value	p
Father										
Boys										
Total expressiveness	11	37.0	14	68.1	11	35.2	9	18.8	9.9	.02-.01[a]
Divergent production	11	.03	14	.07	11	.04	9	.03	6.8	.10-.05
Girls										
Total expressiveness	16	25.3	4	8.5	9	19.6	16	24.3	3.0	.50-.30
Divergent production	16	.05	4	.00	9	.08	16	.05	5.3	.10-.05
Mother										
Boys										
Total expressiveness	13	48.2	13	46.1	6	31.2	13	38.8	2.2	.70-.50
Divergent production	13	.05	13	.05	6	.04	13	.04	0.7	.70
Girls										
Total expressiveness	9	27.6	12	17.2	11	19.5	13	23.4	1.1	.80-.70
Divergent production	9	.07	12	.05	11	.03	13	.05	2.0	.50-.30

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[a] Probability statements give the range of the probabilities for each H value. Thus, the statement .02-.01 means that the probability is less than .02 but greater than .01. Other statements are to be read in the same way except for the one instance in which the probability was exact.

1. For boys, father's AI-IG emphasis appears to influence both total expressiveness and divergent production in the classroom. Inspection of mean scores indicates that sons of high achievement-inducing and low independence-granting fathers do better in classroom verbal output than do sons of other fathers. Thus, it seems that fathers who begin achievement-inducing at a relatively early age and independence-granting at a relatively late age produce sons who excel in classroom performance. In other words, it is the fathers who exert the maximum degree of parental control in child-training who seem to produce the most loquacious sons.

2. For girls, fathers AI-IG emphasis appears to influence divergent production in the classroom. Note, however, that it is the girls whose fathers are low in achievement-inducing and high in independence-granting who have the highest mean score on divergent production in the classroom. Thus, the situation appears to be exactly opposite of that for the boys; i.e., girls whose fathers are relatively late in achievement-inducing and relatively early in independence-granting do best in divergent thinking performance. In other words, it is the fathers who exert minimum control in child-training who produce daughters who are, on the average, most productive in divergent thinking output in the classroom.

The essential results of the second set of analyses are given in Tables 44 and 45. In these analyses an attempt was made to locate the parents who were "very high" and "very low" in achievement-inducing and independence-granting. To accomplish this aim, only parents in the upper and lower quartiles of the distributions of mean ranks for AI and IG were selected for analysis. The upper quartile parents (relatively early age expectancy) were classified as "high" and the lower quartile parents (relatively late age expectancy) as "low." Because of the limited number of cases available it was not possible to control for both AI and IG as was done in the first set of analyses.

The results of interest shown in Tables 44 and 45 are as follows:

3. Boys whose fathers are very high on achievement-inducing (Table 44) do better in total expressiveness in the classroom than boys whose fathers are very low on achievement-inducing. This finding is consistent with the findings shown in Table 43; i.e., the greater the degree of paternal control in child-training the greater the child's verbal output in the classroom.

4. Girls whose mothers are very high on independence-granting (Table 45) seem to say more in the classroom than girls whose mothers are relatively low on independence-granting. This finding is consistent with the finding shown in Table 43; i.e., the girls whose fathers exert minimum control in child-training have greater divergent thinking production than girls whose fathers exert relatively more control.

What is not clear in the pattern of results is (a) why father's emphasis upon AI and IG should have a more potent influence than mothers' emphasis and (b) why fathers' emphasis upon AI should be a more potent influence than mothers' emphasis and why mothers' emphasis upon IG should be more potent than fathers' emphasis upon IG. For example, the pattern of mean scores in Table 44 suggests that fathers' AI emphasis makes more of a difference in performance of both boys and girls than does mothers' AI emphasis. In Table 45, on the other hand, the pattern of mean scores suggests that mothers' IG emphasis has more influence upon total expressiveness for both boys and girls than does fathers' emphasis upon IG.

With respect to the seemingly greater potency of fathers' AI emphasis, two factors should be taken into account: (a) Fathers are usually the instrumental leaders in the family and, since scholastic performance is

TABLE 44

Parental Emphasis Upon ACHIEVEMENT-INDUCING and Child's Total Expressiveness and Divergent Production in the Classroom: Mean Scores and Tests of Significance

Sex of Parent, Sex of Child and Classroom Performance Measure	Parental Emphasis on Achievement-Inducing				Mann-Whitney Test:	
	High		Low			
	N	Mean Score	N	Mean Score	U Value	p
Father						
Boys						
Total expressiveness.......	10	38.7	11	19.0	28	$.10 > p > .05$
Divergent production.......	10	.036	11	.028	48	$p > .10$
Girls						
Total expressiveness.......	9	30.1	8	17.7	22	$p > .10$
Divergent production.......	9	.055	8	.018	24	$p > .10$
Mother						
Boys						
Total expressiveness.......	14	41.8	8	50.6	60	$p > .10$
Divergent production.......	14	.043	8	.046	53.5	$p > .10$
Girls						
Total expressiveness.......	13	15.6	14	21.4	72	$p > .10$
Divergent production.......	13	.052	14	.031	87.5	$p > .10$

TABLE 45

Parental Emphasis Upon INDEPENDENCE-GRANTING and Child's Total Expressivensss and Divergent Production in the Classroom: Mean Scores and Tests of Significance

Sex of Parent, Sex of Child and Classroom Performance Measure	Parental Emphasis on Independence-Granting				Mann-Whitney Test:	
	High		Low			
	N	Mean Score	N	Mean Score	U Value	p
Father						
Boys						
Total expressiveness.......	10	43.2	10	44.1	41.5	$p > .10$
Divergent production.......	10	.038	10	.044	46.5	$p > .10$
Girls						
Total expressiveness.......	11	26.7	13	21.1	62.5	$p > .10$
Divergent production.......	11	.045	13	.053	71	$p > .10$
Mother						
Boys						
Total expressiveness.......	12	58.6	11	49.8	64	$p > .10$
Divergent production.......	12	.041	11	.059	52.5	$p > .10$
Girls						
Total expressiveness.......	8	33.9	13	13.9	26.5	$.10 > p > .05$
Divergent production.......	8	.051	13	.046	40	$p > .10$

essentially an instrumental activity, fathers' influence may be more potent. (b) Achievement-inducing involves positive control of the child with, perhaps, the occasional issuance of specific directives. Independence-granting, on the other hand, involves relinquishment of control. Where specific directives to the child are required for an instrumental activity, it would seem reasonable that the fathers' voice would have the greater influence inasmuch as he is not only the instrumental leader but also the instrumental "expert".

As for the seemingly greater potency of mothers' IG emphasis, an explanation comes to mind less readily. For girls, the mothers relinquishment of control (high IG) would mean relative freedom for the girl from the social-emotional leader and expert in the family. Such increased freedom would permit the girl to develop (if she wished) more masculine instrumental interests such as scholastic achievement. For boys, the evidence of effect of mothers' IG emphasis is less marked and less clear.

The general trend of the "significant" results shown in Tables 43, 44, and 45 seems to be fairly clear. For boys to do well in the classroom requires a fairly high degree of parental direction. For girls to do well in the classroom requires a relatively low degree of parental direction and control. This general pattern in the results agrees with the findings of Bronfenbrenner (1961) in a study of the correlates of adolescent leadership and responsibility. Bronfenbrenner found that boys who received insufficient discipline and love in the home were least likely to receive high rating on leadership and responsibility in school, while girls who were over-controlled in the home were not likely to receive favorable ratings on either leadership or responsibility in school.

In the next and final results section the relationship between type of family organization espoused by parents and child's classroom performance is examined.

Type of Family Organization and Child's Classroom Performance

The types of family organization were developed by Farber (1960a) and are described in detail in the Procedure section. Farber describes three types of family organization which seem to be related to high marital integration -- child-oriented, home-oriented, and parent-oriented. Families which are regarded as not pursuing one of the three types of organization are placed in a residual category. Families in which either (a) both parents are pursuing a type of organization but different types or (b) one parent is pursuing a type of organization but the other parent adheres to none of the types are regarded as "mixed" in organizational type.

The objective of the analysis is to examine the relationship between type of family organization and the child's total expressiveness and divergent production in the classroom. In addition to comparison of child-, home- and parent-oriented families with respect to child's classroom performance, comparison of "organized" families versus "non-organized" families is made. That is, child-, home- and parent-oriented families are combined and then compared with residual and/or "mixed" organization families.

Ordinarily, families are classified on the basis of type of organization espoused by both parents. The same procedure was followed in this study. However, it was decided to also classify families as to type of organization espoused by fathers and mothers separately. Thus, three analyses are performed; one in which type of organization pursued by both parents is taken into account, one in which only fathers' type of organization is taken into account and one in which only mothers' type of organization is taken into account.

The measures of total expressiveness and divergent production used in this analysis are the same as those used in the preceding analysis. Also, the classroom settings used as sources of classroom performance data were the "Group A" settings.

Table 46 gives the mean total expressiveness and divergent thinking scores for the various classifications as to type of family organization. The mean scores were not used in tests of significance of differences between groups but are reported in order to show trends in the data.

Table 47 gives the results of tests of significance of differences between family types for boys classroom performance. While there are no significant differences shown in Table 47 inspection of mean scores in Table 46 indicates that boys from families in which either one or both parents are parent-oriented have consistently higher mean scores in both total expressiveness and divergent production than do boys from child- and home-oriented families. Interestingly enough, for mothers' type of organization, boys from residual category families attain the highest mean scores of all. However, owing to the small number of families in some categories, the results in Table 46 cannot be taken too seriously.

Table 48 gives the results of tests of significance of differences between family types for girls' classroom performance. Two differences which meet the criterion of significance established for this study are apparent. For fathers' type of organization, girls from residual category families do better in both total expressiveness and divergent production than do girls from child-, home- or parent-oriented families. These

TABLE 46

Mean Scores on Total Expressiveness and Divergent Production in the Classroom, by Type of Family Organization, Sex of Parent and Sex of Child

Sex of Parent, Sex of Child and Performance Measure	Type of Family Organization									
	Child-Oriented		Home-Oriented		Parent-Oriented		C,H, and P Combined		Mixed and Residual	
	N	Mean Score	N	Mean Score	N	Mean Score	N	Mean Score	N	Mean Score
Parents Agree on Organization										
Boys										
Total expressiveness	3	7.0	6	17.3	9	60.6	18	37.2	27	46.2
Divergent production	3	.01	6	.02	9	.06	18	.04	27	.05
Girls										
Total expressiveness	3	20.7	7	18.3	8	20.8	18	19.8	27	21.8
Divergent production	3	.04	7	.04	8	.08	18	.06	27	.04
Boys and Girls										
Total expressiveness	6	13.8	13	17.8	17	41.8	36	28.5	54	34.0
Divergent production	6	.02	13	.03	17	.07	36	.05	54	.05
Father's Type of Organization										
Boys										
Total expressiveness	3	47.3	7	30.6	10	58.2	20	46.9	25	39.2
Divergent Production	3	.05	7	.04	10	.06	20	.05	25	.04
Girls										
Total expressiveness	4	24.2	9	14.5	7	8.0	20	14.1	25	26.8
Divergent production	4	.01	9	.02	7	.05	20	.03	25	.07
Boys and Girls										
Total expressiveness	7	34.1	16	21.6	17	37.5	40	30.6	50	32.8
Divergent production	7	.03	16	.03	17	.06	40	.04	50	.05
Mother's Type of Organization										
Boys										
Total expressiveness	5	15.6	8	32.6	10	44.5	23	34.1	22	51.5
Divergent production	5	.02	8	.04	10	.04	23	.03	22	.05
Girls										
Total expressiveness	6	17.8	9	15.3	13	21.1	28	18.5	17	25.4
Divergent production	6	.07	9	.04	13	.06	28	.06	17	.03
Boys and Girls										
Total expressiveness	11	16.8	17	23.5	23	31.3	51	25.5	39	39.9
Divergent production	11	.05	17	.04	23	.05	51	.05	39	.04

TABLE 47

Tests of Significance of Differences Between Types of Family Organization as to BOYS' Total Expressiveness and Divergent Production in the Classroom

Sex of Parent, Performance Measure and Type of Family Organization	Results of Mann-Whitney U Tests		
	N	U or Z Value	Probability (2-tailed Test)
Parents Agree on Organization			
Total Expressiveness			
Child-oriented versus Home-oriented.....	3 & 6	U = 4	$p = .26$
Child-oriented versus Parent-oriented...	3 & 9	U = 4	$p > .10$
Home-oriented versus Parent-oriented....	6 & 9	U = 13.5	$p > .10$
Child-, Home-, and Parent-oriented versus Mixed and Residual.............	18 & 27	Z = .93	$p = .36$
Divergent Production			
Child-oriented versus Home-oriented.....	3 & 6	U = 7	$p = .72$
Child-oriented versus Parent-oriented...	3 & 9	U = 4.5	$p > .10$
Home-oriented versus Parent-oriented....	6 & 9	U = 13	$p > .10$
Child-, Home-, and Parent-oriented versus Mixed and Residual.............	18 & 27	Z = 1.16	$p = .24$
Fathers' Type of Organization			
Total Expressiveness			
Child-oriented versus Home-oriented.....	3 & 7	U = 9	$p = .84$
Child-oriented versus Parent-oriented...	3 & 10	U = 14	$p > .10$
Home-oriented versus Parent-oriented....	7 & 10	U = 25	$p > .10$
Child-, Home-, and Parent-oriented versus Residual......................	20 & 25	Z = .06	$p = .96$
Divergent Production			
Child-oriented versus Home-oriented.....	3 & 7	U = 8.5	$p = .74$
Child-oriented versus Parent-oriented...	3 & 10	U = 12	$p > .10$
Home-oriented versus Parent-oriented....	7 & 10	U = 20.5	$p > .10$
Child-, Home-, and Parent-oriented versus Residual......................	20 & 25	Z = .06	$p = .96$
Mothers' Type of Organization			
Total Expressiveness			
Child-oriented versus Home-oriented.....	5 & 8	U = 13.5	$p = .44$
Child-oriented versus Parent-oriented...	5 & 10	U = 14.5	$p > .10$
Home-oriented versus Parent-oriented....	8 & 10	U = 31.5	$p > .10$
Child-, Home-, and Parent-oriented versus Residual......................	23 & 22	Z = 1.13	$p = .26$
Divergent Production			
Child-oriented versus Home-oriented.....	5 & 8	U = 15.5	$p = .62$
Child-oriented versus Parent-oriented...	5 & 10	U = 18	$p > .10$
Home-oriented versus Parent-oriented....	8 & 10	U = 39.5	$p > .10$
Child-, Home-, and Parent-oriented versus Residual......................	23 & 22	Z = 1.5	$p = .14$

findings are impossible to explain without an exhaustive analysis of the residual category families. Perhaps there are other types of family organization buried in the residual category.

Table 49 gives the results of tests of significance of differences between family types for both boys' and girls' classroom performance. Data from Tables 49 and 46 indicate that boys and girls from families in which both parents are parent-oriented exhibit greater divergent production in the classroom than do children from families in which both parents are either child-oriented or home-oriented.

The trends in the data suggest that children from parent-oriented families are somewhat superior to children from child-oriented and home-oriented families with respect to output of utterances in the classroom classified as divergent thinking. Taking this trend seriously, why should it be? Bernard Farber, originator of the types of family organization, offered a clue by pointing out that parent-oriented parents are absorbed in attaining success in the middle-class status system and, as a result, probably allow their children greater freedom in finding ways to live up to the norms of conduct set by the parents. Being parent-oriented, the parents' attention is focussed elsewhere and is not directed more or less exclusively to either the home environment (home-oriented) or to the needs and demands of the children (child-oriented). In addition, there seems to be a strong emphasis upon achievement in the parent-oriented family; achievement being expected from all family members.

Although the evidence of a relationship between type of family organization and child's classroom performance is tentative, it would seem that analysis of the ways in which families organize themselves and establish priorities to govern expenditure of resources of physical and

TABLE 48

Tests of Significance of Differences Between Types of Family Organization as to GIRLS' Total Expressiveness and Divergent Production in the Classroom

Sex of Parent, Performance Measure and Type of Family Organization	Results of Mann-Whitney U Tests		
	N	U or Z Value	Probability (2-tailed test)
Parents Agree on Organization			
Total Expressiveness			
Child-oriented versus Home-oriented	3 & 7	U = 10	p = .99
Child-oriented versus Parent-oriented	3 & 8	U = 10	p = .78
Home-oriented versus Parent-oriented	7 & 8	U = 25	p = .78
Child-, Home-, and Parent-oriented versus Mixed and Residual	18 & 27	Z = .62	p = .54
Divergent Production			
Child-oriented versus Home-oriented	3 & 7	U = 10	p = .99
Child-oriented versus Parent-oriented	3 & 8	U = 7	p = .38
Home-oriented versus Parent-oriented	7 & 8	U = 20.5	p = .46
Child-, Home-, and Parent-oriented versus Mixed and Residual	18 & 27	Z = 1.08	p = .28
Fathers' Type of Organization			
Total Expressiveness			
Child-oriented versus Home-oriented	4 & 9	U = 16	$p > .10$
Child-oriented versus Parent-oriented	4 & 7	U = 6.5	p = .24
Home-oriented versus Parent-oriented	9 & 7	U = 23	$p > .10$
Child-, Home-, and Parent-oriented versus Residual	20 & 25	Z = 1.96	p = .05
Divergent Production			
Child-oriented versus Home-oriented	4 & 9	U = 15	$p > .10$
Child-oriented versus Parent-oriented	4 & 7	U = 10	p = .52
Home-oriented versus Parent-oriented	9 & 7	U = 28	$p > .10$
Child-, Home-, and Parent-oriented versus Residual	20 & 25	Z = 1.92	$.10 > p > .05$
Mothers' Type of Organization			
Total Expressiveness			
Child-oriented versus Home-oriented	6 & 9	U = 26.5	$p > .10$
Child-oriented versus Parent-oriented	6 & 13	U = 36.5	$p > .10$
Home-oriented versus Parent-oriented	9 & 13	U = 53	$p > .10$
Child-, Home-, and Parent-oriented versus Residual	28 & 17	Z = .59	p = .56
Divergent Production			
Child-oriented versus Home-oriented	6 & 9	U = 22.5	$p > .10$
Child-oriented versus Parent-oriented	6 & 13	U = 40.5	$p > .10$
Home-oriented versus Parent-oriented	9 & 13	U = 48	$p > .10$
Child-, Home-, and Parent-oriented versus Residual	28 & 17	Z = .51	p = .62

TABLE 49

Tests of Significance of Differences Between Types of Family Organization as to BOYS' and GIRLS' Total Expressiveness and Divergent Production in the Classroom

Sex of Parent, Performance Measure and Type of Family Organization	Results of Mann-Whitney U Tests		
	N	U or Z Value	Probability (2-tailed test)
Parents Agree on Organization			
Total Expressiveness			
Child-oriented versus Home-oriented	6 & 13	$U = 25$	$p > .10$
Child-oriented versus Parent-oriented	6 & 17	$U = 30.5$	$p > .10$
Home-oriented versus Parent-oriented	13 & 17	$U = 79.5$	$p > .10$
Child-, Home-, and Parent-oriented versus Mixed and Residual	36 & 54	$Z = .84$	$p = .40$
Divergent Production			
Child-oriented versus Home-oriented	6 & 13	$U = 32$	$p > .10$
Child-oriented versus Parent-oriented	6 & 17	$U = 25.5$	$p = .10$
Home-oriented versus Parent-oriented	13 & 17	$U = 67.5$	$.10 > p > .05$
Child-, Home-, and Parent-oriented versus Mixed and Residual	36 & 54	$Z = .08$	$p = .94$
Fathers' Type of Organization			
Total Expressiveness			
Child-oriented versus Home-oriented	7 & 16	$U = 54.5$	$p > .10$
Child-oriented versus Parent-oriented	7 & 17	$U = 53$	$p > .10$
Home-oriented versus Parent-oriented	16 & 17	$U = 145$	$p > .10$
Child-, Home-, and Parent-oriented versus Residual	40 & 50	$Z = 1.38$	$p = .16$
Divergent Production			
Child-oriented versus Home-oriented	7 & 16	$U = 54$	$p > .10$
Child-oriented versus Parent-oriented	7 & 17	$U = 38$	$p > .10$
Home-oriented versus Parent-oriented	16 & 17	$U = 92.5$	$p > .10$
Child-, Home-, and Parent-oriented versus Residual	40 & 50	$Z = .31$	$p = .76$
Mothers' Type of Organization			
Total Expressiveness			
Child-oriented versus Home-oriented	11 & 17	$U = 77$	$p > .10$
Child-oriented versus Parent-oriented	11 & 23	$Z = .62$	$p = .54$
Home-oriented versus Parent-oriented	17 & 23	$Z = .47$	$p = .64$
Child-, Home-, and Parent-oriented versus Residual	51 & 39	$Z = 1.41$	$p = .16$
Divergent Production			
Child-oriented versus Home-oriented	11 & 17	$U = 89$	$p > .10$
Child-oriented versus Parent-oriented	11 & 23	$Z = .60$	$p = .54$
Home-oriented versus Parent-oriented	17 & 23	$Z = 1.10$	$p = .28$
Child-, Home-, and Parent-oriented versus Residual	51 & 39	$Z = .02$	$p = .98$

intellectual energy might prove useful in attempts to predict the behavior of children.

In the section to follow, the results of the study pertaining to the relationship between family environment and cognitive abilities displayed by the children are discussed.

Discussion of Results

While the analyses of the relationship between family environment and cognitive abilities of children did not produce a plethora of meaningful results, the evidence gathered does seem to point to some general hypotheses. However, it must be remembered that the families studied here have all produced at least one child who has been judged to be academically talented and intellectually gifted. It is, then, a biased sample of all families in the United States with young adolescent children. The general hypotheses put forth are intended to apply only to families similar to those represented in this study.

The results suggest that boys whose parents exercise a somewhat better than average degree of control over them do better on the Consequences test and in total expressiveness and divergent thinking in the classroom than do boys whose parents exercise less control. The above hypothesis is based upon the following evidence: (a) the greater the parental dissatisfaction with boys' general behavior the higher the boys' breadth score on the Consequences test, (b) boys with high AI and low IG fathers were superior to other boys in total expressiveness and divergent thinking output in the classroom, and (c) boys whose fathers were very high on achievement-inducing expectancy said more in the classroom than did boys whose fathers were relatively low on achievement-inducing expectancy. However, there is also evidence that parents who allow boys some leeway to devise their own means of living up to parental standards of excellence produce boys who are superior on total expressiveness and divergent production in the classroom. This hypothesis is based upon the finding that boys of parent-oriented parents did better in the classroom performance measures than did boys with child-oriented or home-oriented parents.

Thus, for boys, it is hypothesized that a kind of "discovery method" of socialization may be most effective in producing children who excel in the classroom and who are not at a loss in a situation which calls for divergent thinking. The phrase "discovery method" seems appropriate in that it implies that the parents set "problems" in terms of expectations and norms of conduct for the child to solve but they also allow the child some leeway in finding a solution. Thus the parents may expect the child to do well academically but permit him to pursue his own particular academic interests rather than closely monitoring his very choice and restricting him to what they think is best.

Viewing the socialization process in terms of "problems" and "solutions" leads to an attempt to characterize different modes of socialization in these terms. Thus, the following pure types or modes of socialization become apparent:

1. The pure authoritarian: The parent sets forth well-defined expectations and standards of conduct for the child and closely monitors his specific choices and his expenditure of time and energy.

2. The discovery method: The parent sets forth well-defined expectations and standards of conduct for the child but leaves him relatively free to make specific choices and to decide how to spend his time and energy.

3. The pure permissive: The parent neither sets forth well-defined expectations and standards of conduct for the child nor closely monitors his specific choices and his expenditure of time and energy.

Of course, there is a fourth type which is logically possible; i.e., the parent who does not set forth well-defined standards of conduct and expectations for the child but who closely monitors his specific choices and actions. Perhaps this last pure type, if it exists, is a kind of dictatorship which demands unquestioning obedience to arbitrary and ambiguous standards.

There is some evidence that the "discovery method" of socialization, or something akin to it, is efficient in producing creative adults. For example, Anne Roe (1951), in a study of eminent biologists, reported an impression of a "general dearth of close ties" in the families of her subjects. In reporting on the backgrounds of creative architects, MacKinnon (1962) notes that the parents of the architects granted them a good deal of freedom to "act independently but reasonably and responsibly." Further, according to MacKinnon, there was often a lack of intense closeness with one or both of the parents. Finally, MacKinnon states that "whatever the emotional interaction between father and son, whether distant, harmonious, or turbulent, the father presented a model of effective and resourceful behavior in an exceptionally demanding career." Thus, Roe and MacKinnon seem to describe a family situation in which parents set high standards of achievement and conduct but allow the child a good deal of autonomy in deciding how he himself will emulate the parental achievement. Incidentally, the work of both Roe and MacKinnon suggests that studies of the extended families (rather than just the nuclear families) of creative persons would prove fruitful.

In contrast to the results for the boys, the results of the analysis of the girls' family environment and classroom performance suggest that girls whose parents exert a somewhat less than average degree of control over them do better on the Uses test and in total expressiveness and divergent thinking in the classroom than do girls whose parents exert more control. The above hypothesis is based upon the following evidence: (a) Girls from large families do better in classroom divergent thinking than do girls from smaller families, (b) girls whose mothers emphasize independence-granting in child-training had higher Uses test breadth scores and greater total expressiveness in the classroom than did girls whose mothers placed less emphasis upon independence-granting, (c) girls with low AI-high IG fathers did better in classroom divergent thinking than did girls whose fathers indicated a greater degree of control, and (d) girls from parent-oriented families did better in classroom divergent production than did girls from child-oriented and home-oriented families.

Assuming that cultural norms governing socialization of girls leads to "overcontrol" with respect to efficient fostering of intellectual productivity, then it may be hypothesized that the "discovery method" of socialization produces girls who excel in the classroom and who are not at a loss in a situation which calls for divergent thinking.

Thus, in terms of fostering classroom productivity in adolescents, the findings suggest that parents may act as compensators for general cultural influences which perhaps tend toward "undercontrol" in socialization of boys and "overcontrol" in socialization of girls; i.e., to arrive at the same optimum conditions for classroom productivity requires, on the average, more parental control for boys but less for girls.

FAMILY STUDY SUMMARY

The purpose of the study was to explore relationships between family environment and the performance of academically and intellectually gifted young adolescents both in the classroom and on paper and pencil tests of divergent thinking ability.

Following a review of pertinent literature, a research questionnaire was designed and pretested. The questionnaire elicited data pertaining to social organization, demograpnic-ecological and social-psychological aspects of family life. In addition, data on parental employment and parental involvement with the school the child was attending were solicited in the questionnaire. Separate questionnaires for fathers and for mothers were designed.

In addition to data supplied by parents, each child was asked to indicate his perception of his parents' satisfaction with his behavior on an instrument which duplicated an instrument filled out by the parents; thus permitting an assessment of accuracy of parent-child communication.

A total of 178 families received the questionnaire in the mail. Of the 178 families contacted, 117 sets of parents and children provided sufficient data to justify being included in a factor analysis. Data were available from 61 families with a boy in the study and from 56 families with a girl in the study.

The parents in the 117 families were in their early to middle forties, had an average of three children, had been married about 18 years, were married and living together at the time of the study and were predominately Protestant. One Negro family was included in the analysis, the remainder were Caucasian. The great majority of the fathers were professionals.

Fathers had attained a median of 18 years of education while the mothers had attained a median of 16 years of education.

Factor analytic techniques were used in the major portion of the data analysis. Data from the 61 families with a boy in the study were factor analyzed separately from the data from the 56 families with a girl in the study. Individual factor scores were computed for each family. The family factor scores were included in second-order factor analyses along with data on the child's verbal performance in the classroom, scores on Uses and Consequences tests, teacher's ratings of cognitive ability and child's scores on a semantic differential instrument. To take advantage of availability of classroom performance data from more than one classroom setting for some of the children, two second-order factor analyses were performed for the boys and two for the girls. There were classroom performance data available for 45 boys and for 45 girls.

In addition to the factor analyses, a special analysis of the relationship between parental emphasis upon achievement-inducing and independence-granting and the child's classroom performance was executed. Also, an analysis of the relationship between type of family organization espoused by parents and classroom performance was executed.

Following are the major findings concerning relationships between family environment and non-cognitive characteristics of the children in the study:

1. For boys, the older the parents at the time of marriage and the older the parents at the time of the study the less favorable the boys' rating of the semantic differential concept of Competition.

2. For girls, the higher the educational-occupational status of the parents the more favorable the child's rating of the semantic differential concept School.

3. For girls, the higher the parents' marital integration score the higher the teacher's rating of the girls' sociability.

4. For girls, the greater the parental satisfaction with the child's instrumental behavior the lower the teacher's rating of the child's sociability.

Following are the major findings concerning relationships between family environment and the child's classroom performance, Uses and Consequences test scores, and teacher's rating of cognitive ability.

1. For boys, the greater the parental dissatisfaction with general behavior of the child the higher the child's breadth score on the Consequences test.

2. For boys, the higher the parents' educational-occupational status the higher the breadth score on the Uses test.

3. Boys whose fathers were high on achievement-inducing and low on independence-granting had higher scores on total expressiveness and divergent thinking in the classroom than did boys whose fathers exerted less control over them.

4. Boys whose fathers were very high on achievement-inducing expectancy did better in total expressiveness in the classroom than did boys whose fathers were very low on achievement-inducing.

5. Boys from parent-oriented families appear to do better in total expressiveness in the classroom than do boys from child- and home-oriented families.

6. For girls, the larger the family the better the divergent thinking performance in the classroom.

7. For girls, the greater the father's contact with the child's teachers the higher the teacher's rating of cognitive ability.

8. For girls, the greater the mother's emphasis upon independence-granting over achievement-inducing in child-training the higher the breadth score on the Uses test.

9. Girls whose fathers are low on achievement-inducing and high on independence-granting do better in divergent thinking in the classroom than do girls whose fathers exert a greater degree of control in child-training.

10. Girls whose mothers are very high on independence-granting do better in total expressiveness in the classroom than do girls whose mothers are very low on independence-granting.

11. Boys and girls from families in which both parents are parent-oriented had higher divergent thinking classroom performance scores than did boys and girls from families in which both parents were either child-oriented or home-oriented.

Interpretation of the findings pertaining to relationship between family environment and cognitive performance suggested that (a) the "discovery method" type of socialization might be most efficient in producing children who perform well in the classroom and in some situations calling for divergent thinking and (b) that to arrive at the same optimum conditions for classroom productivity requires more parental control, on the average, for boys but less for girls.

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APPENDIX A

SCORING MANUAL FOR USES TEST

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I. Procedure

A. Read the subjects' responses carefully. If you feel confident that a response falls into one of the response categories (except the Miscellaneous category) listed for that particular object or thing for which uses are being given then write the number of that category on the code sheet in the blank which has the same item number as the item number on the questionnaire. Be sure to read carefully the "examples" for each category listed along with the brief description of the category.

B. If you feel that you cannot categorize a response with a good degree of confidence and/or if the response clearly falls into the Miscellaneous or Irrelevant categories, then do the following things:

1. Record the case number of the subject and the number of the questionable, Miscellaneous, or Irrelevant item on a separate sheet of paper.
2. Following the subject's case number and the item number record verbatim the questionable, Miscellaneous or Irrelevant response.
3. Leave the places on the code sheet for questionable, Miscellaneous and Irrelevant items blank. These responses will be scored on the code sheet later.

C. Remember that you are categorizing "uses" rather than the "responses" given by the subject. Therefore, be alert for what appear to be single responses on the questionnaire that give more than one suggestion of use for something. For example, in responding to uses for a newspaper the subject may write as a single response "line a wastebasket or make a hat." Such items will count as two uses according to the category system established for classifying newspaper uses. For safety's sake, record all responses that you feel might contain more than one use (along with subject's case number and number of item on questionnaire) and hold for discussion.

D. Once in awhile a subject will "repeat" a response or use; that is, he will give the same use twice. When this occurs, ignore the last or "repeat" response. A repeat response will not be included in the fluency count, i.e., it will not be counted as a response.

E. If the response is illegible it is always classified as "X".

F. Despite the extreme care taken in the development of the categories to contain the uses or suggestions, there will be some uses or suggestions that might reasonably go into more than one category. If you are uncertain as to which of two categories the use should be placed in, refer to the "Supplementary" instructions attached to each system of categories. If, after reading the Supplementary instructions, you are still uncertain as to which of the categories should be used to contain the response, then record the response along with the subject's case number and item number and hold for discussion.

G. When scoring the subject's responses by entering the category number on the code sheet, exercise care to insure that the number of responses indicated on the code sheet accurately reflects that number of uses or suggestions given in the questionnaire by the subject. Thus, if the subject gives more than one use or suggestion in a single response on the questionnaire (see Rule 3.) be certain that he is credited with two or more responses on the code sheet. Also, if the subject gives duplicat or "repeat" responses on the questionnaire be certain that he is not credited with the repeat response on the code sheet. The need for care in indicating number of responses on the code sheet stems from the necessity to assign a fluency score to each subject. If the number of responses is accurately recorded on the code sheet the fluency score can be obtained at a glance. If the number of responses is not accurately indicated, it will be necessary to count the number of responses in order to get the fluency score.

II. Scoring for Fluency, Breadth and Flexibility

A. Scoring for Fluency. Fluency is simply the total number of uses or suggestions given by the subject for a particular object or thing. Since the uses or suggestions given by the subject are numbered in serial order on the code sheet, you should be able to tell at a glance what the "fluency score" is for a particular thing or object (Bricks, Newspapers, etc.).

B. Scoring for Breadth. Breadth may be defined as the number of different categories into which the subject's responses fall. As such, breadth is distinct from fluency. Two different subjects may have equal fluency scores but have entirely different breadth scores. (See example below)

Subject A		Subject B	
Response Number	Category Code	Response Number	Category Code
1.	1	1.	1
2.	2	2.	2
3.	4	3.	2
4.	3	4.	2
5.	7	5.	4
6.	9	6.	2
7.	2	7.	1
Fluency =	7	Fluency =	7
Breadth =	6	Breadth =	3

Thus, Subject A gave the same number of uses or suggestions as Subject B, resulting in equal fluency scores. However, 6 categories are required to contain Subject A's uses while only 3 different categories are required to contain Subject B's uses or suggestions.

C. Scoring for Breadth. (Cont'd) Following are rules for handling of Irrelevant and Miscellaneous uses or suggestions in scoring for breadth.

1. Irrelevant responses, coded as "I" on the code sheet, are not counted in determining the breadth score for the subject. The breadth score is determined only on the basis of uses or suggestions other than Irrelevant. In sum, the best rule to follow for handling Irrelevant uses in scoring for breadth is to make believe they are not there.
2. Miscellaneous responses are counted in determining the Breadth score. Where the subject has given only one Miscellaneous use or suggestion there is no problem. However, if the subject gives two or more Miscellaneous uses or suggestions for a particular thing or situation, then attention must be directed to whether or not the Miscellaneous uses are really different from one another. If they are different, there will be a sub-script attached to the category code for Miscellaneous. For example, if the category code for Miscellaneous uses is 12, and the subject has given two Miscellaneous uses or suggestions which are judged to be different from one another, they will be scored 12_a and 12_b. If they are judged to be the same, they will be scored 12 and 12. In the former instance the Miscellaneous uses will be counted as 2 categories while in the latter instance the Miscellaneous uses or suggestions will be counted as one category.

D. Scoring for Flexibility. Flexibility is defined as the number of "shifts" or category changes observed between adjacent uses or suggestions as you proceed through the list of uses or suggestions in the same order as they were written by the subject. The following examples should help to clarify the meaning of flexibility.

Subject A		Subject B	
Response Number	Category Code	Response Number	Category Code
1.	4	1.	2
2.	1	2.	1
3.	1	3.	2
4.	2	4.	1
5.	2	5.	2
6.	2	6.	4
7.	2	7.	2
Fluency	7	Fluency	7
Breadth	3	Breadth	3
Flexibility	2	Flexibility	6

The "links" between category codes indicate the "shifts." Subjects A and B have equal Fluency and Breadth scores but Subject B had a much higher Flexibility score than Subject A. In the example given above, the difference in Flexibility scores is due entirely to difference in order in which the uses or suggestions were listed by the subjects. However, Breadth or the number of categories required to contain the uses or suggestions listed by the subject also influences Flexibility.

Subject A

Response Number	Category Code
1.	2
2.	1
3.	2
4.	2
5.	2
6.	2
7.	2
Fluency	7
Breadth	2
Flexibility	2

Subject B

Response Number	Category Code
1.	1
2.	2
3.	3
4.	4
5.	5
6.	6
7.	8
Fluency	7
Breadth	7
Flexibility	6

Note that the maximum possible Flexibility score for Subject A is "2", regardless of the order in which the uses or suggestions are listed. For Subject B, on the other hand, the minimum possible Flexibility score is 6, regardless of the order in which the uses or suggestions are listed.

III. Scoring Standards

A. Bricks

1. CONSTRUCTION: buildings; foundations; molding; part of a fireplace; a bookcase; a wall; use as tile
2. DESTRUCTION OR WEAPON: shatter windows; break up cement; break ballons; as a flyswatter; to hit persons; to throw at things on Halloween; ruin some flowers; mar some paint; to make someone stumble over
3. PAVING: for a pathway; street; sidewalk; driveway; patio; gravel; driving on; make a step
4. TOOL: as a hammer; potato masher; use to split things open; writing in dirt; stir paint; kind of ruler or straight edge; cleaning muddy shoes; to knock something over; shaping clay; wedge; mortar and pestle; to dig a hole; to pry something up; a battering ram
5. WEIGHT: paperweight; lift to develop muscle; weight on a pully; anchor; to hold an object in place; balance for a lever
6. DECORATION: color for an art display; powdered to make red paint; to make ink ; chalk; make dye; break it and make a mosaic painting; you can write with chunks of it (on a sidewalk); making figures out of them
7. RECREATION: as a toy for babies; as a toy boat; as a bat; exploding caps; throw it; stick fire crackers under; target; pretend it is a valuable stone; still life
8. SUPPORT: step; doorstop; prop for a hose; to sit on; footrest; pillow; plate; shopping block; as a stepping stone; to put something on; to block something from opening; to keep things on; a bed
9. CONTAINER: flowerpot; penholder; to hide things in
10. INSULATION: to heat and use for warmth; laying hot dishes of food on them; use to contain a fire; foot warmer
11. MISCELLANEOUS: for ants to live under; increase volume of a liquid; to knock apples out of trees; hide things in; putting out a fire; changing a river's course; stopping erosion; as a wall to hold something in; to stop up something; with a certain rock, gives off sparks; for grinding it up and using as filler; to use for fill of a house (or shed); filling in holes; pound on doors; to pop blisters; a blackboard; break it up and use to test direction of wind; measuring things
12. MARKER OR DELINEATOR: marking a trail; starting line for a race; obstacles to set off a path; hand on a sun dial; along edge of driveway; trees; etc.

I. IRRELEVANT: use as a baseball; write on; kick when you're angry; starting fires; brick pile; to break; to cement to another one; throwing at things; breaking; making rocks into powder; to throw at something; to make powder; put in a tree; an auto

a. Supplementary Rules

1. CONSTRUCTION versus PAVING: In general, when the use or suggestion specifies or implies the construction or building of something that is an integral part of a house (floors, walls, foundation, etc.), i.e., if it is "indoors," then put that use in the CONSTRUCTION category. If, however, the use specifies or implies the making of a surface "outside" then put that use into the PAVING category.

2. PAVING versus SUPPORT: If subject writes "make a step," thus specifying the manufacturing process, then put the use into the PAVING category. If, on the other hand, the subject simply writes "step" or "stepping stone" then put that response into the SUPPORT category.

3. DESTRUCTION OR WEAPON versus TOOL: If, in giving the use, the subject mentions breaking, crushing, smashing, etc., a specific thing or object then put that use or suggestion into the DESTRUCTION OR WEAPON category. If, on the other hand, the subject writes "to split things open," "to smash something," etc., i.e., does not mention a thing or object to be acted upon, then put that use into the TOOL category.

B. Heat

1. DRINKING COOL LIQUIDS OR EATING COOL SOLIDS: water; ice; ice cubes; lemonade; drinking fountain; popsicle; ice cream; watermelon; cool water; cold water; a cold fizzie

2. FINDING A COOL SHELTER: a cave; air conditioned room; cool basement; cool compartment; ride in an air conditioned car; shade; shade tree; sitting in the shade; lay in shade; shut yourself inside refrigerator; close shades

3. COOL CLOTHING OR REDUCED CLOTHING: (include "hair cut"; "keeping hair off neck"; etc.)

4. MECHANICAL COOLING METHODS AND DEVICES: hand fan; fanning yourself; air conditioner; electric fan; refrigerator; freezer; sit in front of a refrigerator with the door open; sit in front of a fan; a servant to fan me; bribe your sisters and brothers into fanning you

5. SEEKING COOLER CLIMATE OR NATURAL ENVIRONMENT: ocean; lake; stream; river; be by water; get on a high hill; climb a high tree; walk in a shady forest; travel to Alaska or to Anarctic; tall trees; stand in a windy spot; tall grass; go outside in winter

6. REDUCED ACTIVITY: rest; relax; sleep; get in a comfortable position; swing in a hammock; stop work; lie on basement floor; bed by an open window; lots of servants to do things for me; sofa; a couch; a bed

7. COOLING RECREATION OR ACTIVITY: (exclude swimming or wading) fishing; sailing or boating; go for a bike ride; airplane ride; ride in a convertible; riding a horse; have a sledding or skating party; riding in a car; take a ride; standing on the wing of an airplane

8. THINKING COOL AND DISTRACTION TECHNIQUES: read a story about the North Pole; nice steak to eat; T. V. set; occupy mind to forget about heat; see someone else more miserable than you; some ocean catfish; sandwich and other food; money; enjoying something and yet not being active; something to do; certain person; one or two other people

9. COLD OR COOL OBJECTS OR MATERIALS ON BODY: (excluding water) ice pack; wet cloth; cool stone or brick; sitting in cool sand; alcohol rub; sitting on a cold floor

10. BATHING, SWIMMING OR WADING: take a cool bath; shower; swimming pool; swim; run under a lawn sprinkler; open a fire hydrant; slosh around in cool mud; hot bath; give an animal a bath; a swim in the Arctic Ocean; pour a glass of cold water over your head

11. NATURAL COOLING CONDITIONS AND PROCESSES: rain; snow; hurricane; cloudy sky; night; cool breeze; cool air; a frost; coolness; open window; winter; air; dry air

12. ELIMINATE ARTIFICIAL SOURCES OF HEAT: turn off lights; turn off furnace; staying clear of fires

13. MISCELLANEOUS: liquid oxygen; open windows; cloth to wipe away perspiration; get out of school; take an aspirin; take a fever pill; sweat; bug sprays to kill bugs; salt tablets

I. IRRELEVANT: A cool cat; running; a rubber raft; some swim fins; an aqua lung; a spear gun; pillow; coolness; a cooler; (if lost) home; (if marooned) a ship

a. Supplementary Rules

1. FINDING A COOL SHELTER versus SEEKING COOLER CLIMATE OR NATURAL ENVIRONMENT: If the emphasis is upon "shelter" and/or "protection from the sun" and implies at most a restricted kind of seeking, then put the suggestion into the FINDING A COOL SHELTER category. If on the other hand, the emphasis is more upon seeking a general environment that is cool, if the seeking is more "wide ranging" or if the suggestion simply specifies one component of a cooler environment ("tall trees," for example), then put that response into the SEEKING COOLER CLIMATE OR NATURAL ENVIRONMENT category.

C. Water

1. POWER PRODUCTION: for turbines; dams; to dam up; paddle wheels; electricity; to grind flour or corn; run a steam boat; boil in engines; boil water for pressure; harness power of a waterfall

2. NOURISHMENT AND AID TO INGESTION OR DIGESTION: for survival; to feed people or animals; keep you alive by having it in your food; to quench thirst; to refresh people; to take pills; to aid digestion; to drink when you are hot; fill my canteen; a cup of tea, coffee (to quench thirst)

3. CLEANING, WASHING, AND BATHING: to use while cleaning fish; to wash yourself; to take a bath or shower; wash dishes; wash floors in a home; to carry away waste; wash away debris, in sewers, in toilets; to soak socks and keeps you clean; getting rid of trash

4. TRANSPORTATION: water current; current for ships; current for rafts; to sail a boat on; to row a boat; rivers for boating; makes a place to go boating

5. COOLING AGENT: in a radiator to cool a car engine; in an airplane; to freeze and keep things; make ice cubes; put in ice box; a cool bath; a cold shower; to make a cooling system; to make coldness; as ice; to cool off with; to freeze for ice

6. FARM--GARDEN: for irrigation; for rain on crops; to water something; to keep things alive

7. RECREATION: for the enjoyment of swimming; to fight with; to fill a pool; playing in; splashing in; throw on people; for fishing in; to paint with; for water color painting; waterfalls are a tourist spot; making believe it's raining; threatening people with glasses full of it; seeing if dolls can float

8. FIRE EXTINGUISHER:

9. AS A SOLVENT, INGREDIENT, OR BASE: to dilute drinks; to make ink; to mix with clay or sand; make jello; help make paper or books; use it to mix a cake with; making foods and salads; to make liquids; make blood cells; to make cold cream; to make hand lotion; distilled water; starching clothes; developing film negatives; plasma, or artificial blood; medicines; it's used in coke; mixed with mud and straw; to help make food

10. COOKING OR WARMING AGENT: to boil; cook vegetables; as a steam heater; to sterilize things; steam; to soak feet; to soothe sore feet; to make a heating system; to make heat

11. AS AN ENVIRONMENT FOR FISH AND OTHER FORMS OF LIFE: to put fish in; to help my turtles (healthwise); as a place for fish to live; make a home for fish; supplying fish; it brings fish to you

12. AS A DAMPENING AGENT: steam iron or ironing; use it to comb your hair; dampening clothes; to keep cement moist

13. FOR EXPERIMENTAL PURPOSES: use in experiments; to experiment with; use in science analysis

14. MISCELLANEOUS: to look under a microscope with; to make snow and ice; to lubricate things; boiling salt water to get salt; to drown in; for soil erosion; cut rock, valleys, and caves; as a measuring device; as a ballast; artificial rain; to pump water, use as a clock; waking someone up; to use in a water cooler (a type of air conditioner); by pathing the steam; steel production

I. IRRELEVANT: put under pressure; filling in holes; waterfall; to discolor; narrow its course; give work; getting detentions in science; to fill people's shoes with; through a jetty; for rainstorms; for floods; schools; buildings; in drains, in pipes; electric bulb; to throw things that can't burn away; purify; means of communication; chemical advantage; blast rocks; in ice houses; to preserve things; it can be made into a kind of fuel for small motor boats; in mining; rain; for rain; to make rain; in the ocean you can pump oil from water; makes lakes, rivers, and oceans

a. Supplementary Rules

1. POWER PRODUCTION versus COOKING OR WARMING AGENT: If subject mentions "steam" or "boiling" but does not specify power production of some kind, then put the use or suggestion in COOKING OR WARMING AGENT category.

2. CLEANING, WASHING AND BATHING versus COOLING AGENT: If the subject mentions "washing" or "bathing" but does not mention temperature, put the response in CLEANING, WASHING AND BATHING category. However, if subject specifies "cool bath," "cold shower," etc., then put the response in the COOLING AGENT category.

3. TRANSPORTATION versus RECREATION: Uses for water such as "makes a place to go boating," "to sail a boat on," and "to row a boat," which do not explicitly mention recreation activities other than "boating" will be classified as TRANSPORTATION.

D. Screwdriver

1. DRIVING SCREWS, RIVETS, ETC.: drive a screw; repair furniture; fix appliances; attach something to a wall; take things apart or put things together (also to build something or to remove something); build bridges; as a screwdriver

2. WEAPON OR DESTRUCTION: stab a person; hit a crook with; break things with; poke someone; make dents in furniture; knocking over lamps; tearing clothes apart; knocking over all the furniture; ruining doors; tear a coat; break a lock; as a sling shot with soft things; to wreck something

3. CUTTING, CHISELING, SCRAPING: punching holes; use as a knife; split a screen; ice pick; chiseling; punch holes in cans; punch holes in paper; pencil sharpener; chip masonry; cut on flint to start fires; girding a tree; to open letters; as a file; to widen holes; to use as a saw; use as flint and steel; cracking things (splitting); put a piece of sandpaper on the tip and sand down something small; splitting small pieces of wood; for erasing marks on paper; scratch mosquitoe bites

4. HAMMERING OR POUNDING: hammer a nail; pound a tack into a bulletin board; knock a board loose from a wall; as a mallet; to help bend something; push in something; use it to hit something shut

5. PRYING, DIGGING, WEDGING: pry a window open; pry things up or apart; pulling up staples; as a lever; wedge; to dig with; digging rocks out of the soil; crowbar; to use as a dandelion poker; opening a tight glove compartment; to help knock off a hub cap; remove tube from bike tire; for removal of electrodes (in zone electrophoresis); opening a film box; for taking out the metal part of a Xmas tree light bulb; to use as a kitchen tool; to loosen something; to drill with; open wire binding with; jamming a door; a separater; to open a box; help put on shoes; opening up pins for wheels; to open a twist-off cap; as a can opener

6. MEASUREMENT: measure the length of a table

7. CLEANING: cleaning fingernails; clean out a pipe; as a toothpick; cleaning mud off shoes; as a cobweb cleaner outer

8. WEIGHT: use as a ballast; paper weight; to hold something in place; plumb line weight

9. SUPPORT: prop open windows; make a coil out of wire wrapped around it; keeping a clam open; stake in a tent; as a part of a tourniquet; bookmaker; to put in a rope and twist to make rope tighter; place under uneven chair leg; a stand for something; use as a table lamp stand

10. RECREATION OR AMUSEMENT: play a game of mumblypeg; use as a bat; balance on your nose; using as a drum; practice in knife throwing; make a doll from one; to use as a steeple to a play church

11. MIXING LIQUIDS: mix paint; swizzle stick; eggbeater

12. MARKING: as a writing tool; marking off sections of a board; to make an indentation on a piece of wood

13. ARTISTIC: carve wood; use for sculpturing; for decorations on a wall; as a paint brush when minute details are added

14. MISCELLANEOUS: getting things out of small places; use as eating utensils; use as a door knob or a key; a conductor; poke something; to thump to find beams; knock on something to get someone's attention; heated to melt plastic; open a safe; if wooden handle, a torch; plug hole; disarming bombs; getting a tooth pulled; open a locked door; opening a lock; to melt to get metal; to give someone as a gift; to propell something; spread butter (with flat end); to give to a baby to play with; to start fire, as a stake; use as a brand; unlace shoes; poking or pushing something out of a crack; fishing for something; picking up something; open doors; completing an electric circuit; putty knife; to ground electricity; to use as a nail; to mark a place, a marker for something

I. IRRELEVANT: (marked as I) something not understandable or significant; examples: a magnetized screw; a charm; to litter up the workshop; take it apart, keep in a tool box; as armor; holding things together; start a fire; holding boards together (with holes in them); base for a Christmas tree; to use as a knife switch; to fix typewriter if the "l" key is missing; a nail-end; pressure top glass jars; reassure proper wiring; hold things; holding screws and bolts; pastel stick; to launch a rocket; to use in the farmer's fields

E. Newspapers

1. COVERING, WRAPPER, MAT OR CONTAINER: bury things in it; cover open windows; wrapping meat for freezer; protect floor while painting; put muddy shoes on; protective coverings; mats for sitting; hospital bags; paper cups; coat (for ladies to step on) for cheap Raleighs; to use to keep a floor clean; throwing in waste baskets to hide something; to put garbage in and crumble; using for a dish or plate; to be used as a protector; to blow the spit out of my trombone on; to make an ice cream cone; bandage

2. AS STUFFING, LINING OR PADDING: line waste baskets; stuff boxes; put in wet shoes; padding for furniture; to stuff bags; to protect dishes; when crumbled to break a fall; making shoes fit; to wrap fragile things in; to cut up and put in white mice cages; cushion; pillows; hot pad

3. AS SHELTER AND INSULATION OR LINING FOR TEMPERATURE CONTROL: use as a blanket; insulation; fill in crack in the floor; wallpaper; protect beggars from the cold; shelter something; shade from sun; umbrella; to keep out light when sleeping; cat's or dog's box; put in cracks of doors to keep tight; rain hat

4. FOR MAKING TOYS, CONFETTI AND FOR ARTISTIC OR DECORATING PURPOSES: make a kite; paper airplanes; confetti; sailboat; use as a target; paper folding; making dolls; paper mache activities; making a dress pattern; make book marks; stuffing for a puppet; making masks; plaster builder apparatus; to throw as airplanes and spitwads; to make a lamp shade; make a tree out of newspaper

5. CLOTHING: make a hat; use as a muffler; hula skirt; make a shirt

6. CLEANING: use as a rag; clean mirrors; clean up paint messes; to clean or blot something; towel; muddy feet and shoes; napkins, hankies

7. TOOL: fly swatter; use as a hammer; use as a dustpan; fan; sweep dust from corners; funnel; wedge; to pour water, milk, etc.; paddle; back scratcher

8. INFORMATION OR EDUCATIONAL PURPOSES: to read; learn new words; learn how to write; use as a reference aid; use in keeping records of history; cutting articles from; clipping for school; help in making reports; cutting out pictures to use for scrapbooks; communication; to express one's views; to make books out of; for clean and wholesome reading

9. WEAPON: use as a club; spanking pets; knock over a lamp with; to scare away a dog by throwing it; to shoo a dog from a place where he is unwanted; breaking windows; scaring people in dark; scare an animal (rattle it)

10. STARTING OR EXTINGUISHING FIRES: start a fire; burn to make CO_2; make a torch; firecracker fuse; flare inside a milkcan; burn to made carbon monoxide; wad it up for a fire; causing fires; to burn, as a fire; helping a school burn

11. AMUSEMENT OR ENJOYMENT: sports section is entertaining; the pleasure of the comics; for pleasure; for a little laughter; for the enjoyment of the reader; work puzzles; crossword puzzles

12. PROPAGANDA AND ADVERTISING MEDIUM: influence and persuade readers; aid in selling and buying articles; the creation of a public image, advertising

13. MISCELLANEOUS: in training animals; teaching dogs; teaching a dog to fetch; to play with your dog with; to play catch with; to play games; can be used in different tricks; mend things; prop up a light object; as a baton in a relay race; point with it; paper wads; to obtain words from it; taking letters to form sentences; cutting words out for ransom notes; cut letters out of it; ink tests; level objects; to make home furnishings; point with; plug a leak up; to use as a plug for a drain; ciggies (cigarettes); to plug up a hole; make stencils out of them; eyeshade; to make a loud speaker; make knots to exercise; see how many times you can fold it; blindfold

14. ECONOMIC USES (INCLUDING SALVAGE AND RE-USE): get new (buy); buy papers; to sell; deliver papers; to sell as a paper boy would; as a delivery boy; to make money; make money for newspaper employees; for a job in the newspaper office; to use for magazine drives; collect them and get money off of them; paper drives; to give the Salvation Army, pulp reprocessed; grind it up to re-use the pulp; to give to the junk man

15. USE TO WRITE, PAINT OR DRAW ON: a blackboard; use for scratch paper; for testing painting; to paint on; to write on; doing important figuring; paint the pictures

I. IRRELEVANT: tearing up and throwing away; tear it up; throw away; tearing when mad; to make a room look messy; a goat to eat it; fire hazard; when crumbled to break a pole; (following examples IRRELEVANT because they are vague) school; stop light; books; comic books; cardboard; charts; signs; pencils; pens; make an advertisement out of it; burn to make water; as cutting paper; to fold and throw; to make use of printing presses; to eat if you were real hungry; put on something to make bigger; pictures; carving; to make things (out of things); background for bulletin board; in art it is useful; to look at; scrap paper; shredding; shoes; getting printer's ink on things

F. Cold

1. DRINKING AND EATING WARM FOODS AND FLUIDS: hot tea; coffee; soup; a hot meal; water; orange juice; fruit; candy; food; eat a lot; sandwich; hot fudge sundae

2. FINDING PROTECTIVE OR WARM SHELTER: go to bed; steel mill; warm car; snow (to burrow into); a crowd of people; snuggle around warm animals; a lean-to; a fence or side of a house for wind protection; a steam cabinet; a forest; a book to block the wind; school; incubator

3. CREATING HEAT OR FIRE: build a fire; heating pad; hot water bottle; turn up the furnace; light or lamp; hot bath; an atomic reactor; studio lights; an electric blanket; gas heating; hot air; handwarmer; a liquid bismuth bath; electric generator; kiln; radio (gives off heat); sterno; hot bricks; Bar-B-Q grill; electric skillet; warm water; hot water; 2 sticks; electricially heated socks; heated swimming pool; swimming pool with warm water; a source of heat other than your body; a hot wire; forest fire; heated clothes; warm rags; get wrapped in something warm; wood; coal

4. SEEK WARMER CLIMATE: go to Florida; take a South Seas trip; sunshine; volcanoes; warm winds

5. INCREASED PHYSICAL ACTIVITY: walk faster; do something; work up energy; play football; massage; running; swimming; breathing fast

6. APPROPRIATE CLOTHING OR COVERING: scarf; sweaters, mittens; thermal underwear; ear muffs; hair or beards; blankets; boots; canvas; keep yourself bundled up or held together; sheets; paper clothing; newspapers used as clothing; a second wig; hot mitt; dark clothes; sleeping bag

7. DISTRACTION TECHNIQUES: read a good book; pleasant company; happiness or excitement to keep you going; thinking about warm things; thinking that spring is coming; gum; sing; nap; sleep; getting mad at someone; "Hawaiian Eye"; someone else who was cold; people you love; hope; gladness; anger

8. MISCELLANEOUS: keep your back to the wind; sawdust; dead air space; morphine; another person or animal (no verb); a friendly, furry animal; dryness; modern conveniences; insulation; an insulator; cool water if you are real cold; being able to sit down and curl up; radio (to call for help); paper for insulation; put cold part of body, such as hands, to a warmer part; a cuddly pet; helpful suggestions; a stuffed toy; seat covers; friends; cup hands to cover nose; St. Bernard; when it's really cold, pray for numbness; blow in your hands; fat

I. IRRELEVANT: (score as I) anything ambiguous or not understandable; (ex. Newspapers; Puff; ocean; gun; a long length of rope;) leaves; grass; paper; cold tablets; aspirin; death; a poker; high blood pressure; a bowl of ice cream; take some pills; you may be getting a cold; cough syrup; touching the ends of two live wires; pillows; ocean; comfort; electricity; mattresses; towel; if you get warm, stay warm; stopping source of cold; get warm

a. Supplementary Rules

1. FINDING PROTECTIVE OR WARM SHELTER versus MISCELLANEOUS: If subjects write "a crowd of people" or "snuggle around warm animals" or similar, then place response in SHELTER category. However, if subjects simply mention an animal or another individual but do not specify warmth, then put that response in the MISCELLANEOUS category.
2. CREATING HEAT OR FIRE versus APPROPRIATE CLOTHING OR COVERING: Responses which mention clothing or covering but which specify that the clothing or covering is heated or warmed, i.e., an electric blanket; heated clothes; warm rags; get wrapped in something warm; will be placed in the CREATING HEAT or FIRE category rather than in the CLOTHING or COVERING category.
3. APPROPRIATE CLOTHING OR COVERING versus IRRELEVANT OR AMBIGUOUS: If the subject writes only "paper"; "mattresses"; "pillows"; "towels"; or other materials or objects (other than animals or persons) not ordinarily regarded as clothing covering, categorize those responses as IRRELEVANT on the grounds of ambiguity. If however, subject writes "paper clothing" or "newspaper used as clothing," i.e., specifies how the material or object is to be used, then categorize the response as APPROPRIATE CLOTHING OR COVERING.

APPENDIX B

SCORING MANUAL FOR CONSEQUENCES TEST

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APPENDIX B

SCORING MANUAL FOR CONSEQUENCES TEST

I. GENERAL RULES - CLASSIFICATION OF CONSEQUENCES RESPONSES

A. Read the subjects' responses carefully. If you feel confident that a response falls into one of the response categories (except the miscellaneous category) listed for the particular consequence then write the number of that category on the code sheet in the blank which has the same item number as the item number on the questionnaire. Be sure to read carefully the "examples" for each category listed along with the brief description of the category.

B. If you feel that you cannot categorize a response with a good degree of confidence and/or if the response clearly falls into the Miscellaneous or Irrelevant categories, then do the following:
1. Record the case number of the subject and the number of the questionable, Miscellaneous, or Irrelevant item on a separate sheet of paper.
2. Following the subject's case number and the item number record verbatim the questionable, Miscellaneous or Irrelevant response.
3. Leave the places on the code sheet for questionable, Miscellaneous and Irrelevant items blank. These responses will be scored on the code sheet later.

C. For safety's sake, record all responses that you feel might be questionable (along with subject's case number and number of item on questionnaire) and hold for discussion.

D. Once in a while a subject will "repeat" a response or use; that is, he will give the same use twice. When this occurs, ignore the last or "repeat" response. A repeat response will not be included in the fluency count, i.e., it will not be counted as a response.

E. If the response is illegible it is always classified as "X."

F. When scoring the subject's responses by entering the category number on the code sheet, exercise care to insure that the number of responses indicated on the code sheet accurately reflects that number of consequences given in the questionnaire by the subject. Thus, if the subject gives more than one consequence in a single response on the questionnaire be certain that he is credited with two or more responses on the code sheet. Also, if the subject gives duplicate or "repeat" responses on the questionnaire be certain that he is not credited with the repeat response on the code sheet.

II. Test Questions

A. Pills

1. PHYSICAL HEALTH AND ABILITIES. (Includes changes in physical well-being, in physical abilities, and changes that have direct implication for physical well-being.)

   We would have fewer nutritional ailments.
   Many people wouldn't get too fat.
   People would be healthier.
   People would go hungry because there is not enough down there to fill them up.
   You would lose your sense of taste.
   Food would be easier to digest.
   Less sickness because of spoiled food.

2. MENTAL HEALTH, ABILITY AND SKILLS.

   People would become bored with pills.
   People would be unhappy.
   Housewives would become lazy.
   People would be smarter, more intelligent.

3. BUSINESS, INDUSTRIAL AND ECONOMIC CHANGES. (Responses that indicate expansion or decline of a business or service, changes in cost of equipment and services; do not include responses pertaining to individuals or classes of individuals or responses pertaining to the development of new services and equipment, See Category 5.)

   Grocery stores would go out of business.
   Drug stores would become rich.
   Silverware companies would go bankrupt.
   Food would become much cheaper.
   No more food advertisements in the newspaper.

4. EMPLOYMENT. (Includes responses which affect individuals or classes of individuals.)

   Dishwashers would go out of business.
   Farmers would go out of business.
   Druggests would become wealthy.
   Doctors would have more business.
   Dentists would go out of business.

5. CHANGES IN SOCIAL VALUES, NORMS AND ATTITUDE. (Changes in the value that society places upon something. Do not include changes in mode of behavior or changes in the frequency of doing something.)

   People would eat food on special occasions.
   Wouldn't need to give dinner parties for social occasions.
   Time would not be so precious.

6. EDUCATIONAL CHANGES. (Changes which mention schools, methods of teaching, changes in subject matter being taught, changes which mention teachers, etc.)

    Schools would be in session less time during the day.
    No cafeterias needed in schools.
    Kids could eat lunch while doing their lessons.
    No agricultural schools.
    Schools wouldn't teach about proteins and carbohydrates.

7. RECREATION AND CULTURAL ACTIVITIES. (Includes changes in leisure time activities, decline or expansion of modes of recreation or entertainment.)

    Baseball and football games can be played any time, instead of between meal times.
    We won't have to stop playing games to go eat.
    Still-life painting would be of different colored pills rather than different food.
    "Tea for Two" would be sung, "Pills for Two."
    More time for sports and games at a picnic.

8. AGRICULTURE. (This involves all discussions related to changes in farming, but does not involve the farmer who is included under EMPLOYMENT.)

    Farm animals would disappear.
    Corn would no longer be raised.
    Farms would be changed into housing subdivisions.
    No more dairy cattle.
    Farmers would have to raise the material that goes into the pills.

9. CONSERVATION OF SPACE AND STORAGE.

    You could carry your lunch in your pocket.
    It would be easier to store the pills.
    It wouldn't be as crowded in the car with all those grocery sacks.
    It would take up less space.
    Food would be stored longer.

10. ELIMINATION OF HOUSEHOLD TASKS.

    Girls wouldn't have to do as many dishes.
    You would never have to learn how to cook.
    Meals would not be as hard to fix.
    You wouldn't have to go shopping as much.
    Mothers wouldn't have to prepare meals.
    You wouldn't have to set the table.

11. CONSERVATION OF TIME DEVOTED TO EATING. (Only for statements about timesaving - if the use of the time saved is mentioned it would fit another category, i.e. More time for sports at a picnic. More time for school work.)

You would have more time on your hands.
It wouldn't take as long to eat.
You wouldn't lose time eating.
There would be more time for other things.

12. CHANGES IN EATING HABITS.

It would change eating times.
We would not have many meals together.
There would be less eating between meals.
There wouldn't be any supper, lunch or breakfast.
It would revolutionize eating habits.

13. NEW OPPORTUNITIES. (This category includes the concept of space conservation and lack of spoilage and what could be accomplished as a consequence.)

Space travel would be made easier.
We could live on the moon more easily.
We could ship food overseas quicker and more easily.
People could survive in Antarctica.
We could live in arid places where there is not fertile ground for growing food.

14. LACK OF VARIETY, FLAVOR, AND PLEASURE IN EATING.

There would be less variety; it would take the pleasure out of eating.
Food would not taste as good.
It wouldn't be as much fun to eat.
There probably wouldn't be as big a variety of foods.
We probably wouldn't like eating.

15. DISORGANIZATION AND CATASTROPHE.

Wars would increase.
Everyone would be fighting for supplies of pills.
Our entire economy would collapse.
Agricultural nations would collapse.

16. MISCELLANEOUS

No more cracker crumbs in bed.
There would be different colors for different meals.

17. IRRELEVANT

You wouldn't get enough to eat.
People would get fat.

B. Fingers

1. PHYSICAL HEALTH AND ABILITIES. (includes changes in physical well-being, in physical abilities, and changes that have direct implication for physical well-being.)

   You couldn't brush your teeth.
   You couldn't bowl.
   People couldn't help themselves.
   We couldn't use guns to protect us.

2. MENTAL HEALTH, ABILITY AND SKILLS.

   People would all be frustrated.
   Machines would do all our work and we would get lazy.
   Musical instrument players would go crazy.

3. BUSINESS, INDUSTRIAL AND ECONOMIC CHANGES. (Responses that indicate expansion or decline of a business or service, but do not include responses pertaining to individuals or classes of individuals as in Category 4, or changes or revisions of equipment or development of new equipment as in Category 5.)

   Glove companies would go out of business.
   Nail polish companies wouldn't have much business.
   Industries would close down.

4. EMPLOYMENT. (Affecting individuals or classes of individuals.)

   Music teachers would be out of business.
   People couldn't have many occupations.
   Baseball players would be out of jobs.
   Rug-weavers would be out of business.
   Policemen and firemen could not do their jobs.

5. TECHNOLOGICAL CHANGES.

   We would have machines to write for us and machines to feed us.
   Gloves would be redesigned.
   Baseball mit manufacturers would change the shape of their mits.
   We would need pushbuttons developed for everything.
   Musical instruments would have to be changed.
   Automobiles would be redesigned.
   Steering wheels would be changed.

6. CHANGES IN SOCIAL VALUES, NORMS AND ATTITUDES. (These are changes in the value that society places upon something, not changes in mode of behavior or in the frequency of doing something.)

   People with four fingers and a thumb would be looked on as freaks.
   Mental ability would be valued more and physical ability less.

7. EDUCATIONAL CHANGES. (This includes all changes which mention schools, methods of teaching, changes in subject matter being taught, changes which mention teachers, etc.)

We would have to use typewriters rather than pencils in school.
The number system would be changed to the base six.
You wouldn't have to go to school.
There would have to be new training programs to train people how to do different kinds of jobs.
Schools wouldn't have basketball or football teams.

8. RECREATIONAL AND CULTURAL CHANGES.

It would be difficult to play baseball.
Jumping rope might be eliminated.
You couldn't play a musical instrument properly.
A new type of art would have to be introduced.
Soccer would become a more popular game.
Wouldn't be able to catch a ball.
Hard to reel in a fish.

9. WRITING AND DRAWING. (Restrict to responses which mention difficulty in writing and drawing or alternate methods of writing or drawing. Do not include responses which mention difficulty in holding or grasping pencils etc. See category 12).

You would have a hard time writing.
You would not draw very well.
We might do more painting with our toes.
Pencils would not be of much use.

10. TOOLS. (Responses which either specifically mention difficulties in use of tools or which mention activities requiring the use of tools or alternatives to use of tools.)

We would have to eat with our fingers.
We couldn't rake leaves.
We couldn't mend clothes.
We couldn't build houses.
We couldn't cut paper or cloth.
We couldn't use a spade or a screwdriver or a hammer.
We couldn't sharpen a pencil.
We would have to sew differently.

11. CONTROL OF VEHICLES AND MACHINERY.

We couldn't drive cars.
We couldn't ride bicycles.
People wouldn't be able to operate machines as well.
It would be harder to work machines.

12. GENERAL CHANGE IN USEFULNESS OF HANDS. (Includes all responses not covered in categories 9, 10, 11 and involves such activities as pulling, holding, buttoning, grasping, picking up, etc.)

Couldn't wash dishes.
You couldn't button your clothes.
You couldn't pull weeds.
It would be hard to pick things up.
You couldn't pick up a fork.
You could not strangle anything.
You couldn't hold a glass too well.
You couldn't hold a pencil.
You couldn't turn a doorknob.

13. CATASTROPHIES AND DISASTERS.

Our culture would be put back to the Middle Ages.
Nobody could do anything.
People would be helpless.
Our economy would collapse.

14. MISCELLANEOUS.

Boy Scouts would have it easier saluting.
Expressions like "having a green thumb", or "twiddling your thumbs" would disappear from our language.
No more thumbnail sketches.

15. IRRELEVANT.

I wouldn't like it, everybody would get fat.

C. Heat

1. PHYSICAL HEALTH AND ABILITIES. (Responses which make specific reference to physical well-being of human beings, including mention of increase or decrease in bodily functions. However, do not include responses which refer simply to increased or decreased comfort, See Category 2).

   Baseball players would have to build up their edurance.
   Basketball players would sweat more.
   People would become lazier.
   Would be healthier.
   I wouldn't have colds.
   People wouldn't get hurt on ice and snow as much.
   There would be fewer accidents because of ice and snow.
   Would get fat from drinking so much.
   There would be no ice for people to fall on.
   I would lose about 2 pounds a day in sweat.
   I could get a decent suntan.

2. GENERAL PHYSICAL COMFORT AND DISCOMFORT. (References made to general discomfort as a result of increased temperature. Do not include response that simply indicates a climate change but which does not specifically refer to human or animal comfort, See Category 3).

   It would get unbearably hot.
   In the summer people wouldn't sleep as well.
   It would be a lot more miserable in summer.
   It would be much more unbearable in summer and pleasant in winter.
   You would be hot in summer.
   Would roast to death.
   People would be hot.
   We would be miserable.
   We wouldn't get so cold.
   You wouldn't freeze as much in winter.
   Animals would suffer in the summer.
   Life would be easier in winter and harder in summer.

3. CLIMATE CHANGES. (General responses indicating change in climate but which do not (a) specifically state anything about physical health of human beings or (b) state anything specifically about comfort or discomfort of human beings, See Categories 1 and 2).

   In the winter it would be fair.
   It would be warmer in winter.
   It would be a lot hotter in the summer.
   It would be hot.
   Would have little snow.
   Winter would be like spring.
   We wouldn't have the same type of climate.
   It wouldn't hail so often.
   It wouldn't rain too often.

It might be dryer.
Would have better weather.
No snow on Christmas.
More humidity.
Longer summers.
The seasons would come one season sooner.
The ground would be dry.
There would be little water.
Less water in the summer.

4. COOLING METHODS AND DEVICES. (Responses indicating increased use of cooling methods and devices. Do not include (a) responses indicating changes in cooling methods and devices or development of new methods and devices (See Category 5); (b) responses which mention clothing changes (See Category 6); (c) responses which are primarily recreational in content (See Category 9); or (d) responses which specifically mention changes in cost of something or increase and/or decrease in a business or service (See Category 7).

There would probably be more air conditioners.
There'd probably be more air conditioned cars.
We would run our air conditioner a lot more.
We would need an air conditioner.
More iced tea and lemonade.
Need more shade trees.
Cold drinks would be made and drunk very quickly.
We would have small, cool houses.
In summer cool foods and drinks would be more popular.

5. TECHNOLOGICAL CHANGES AND ADVANCES. (Responses which indicate need for change in methods and/or equipment to meet new conditions. Do not include responses which (a) mention only increased or decreased use of something (See Category 4); (b) specifically mention economic implications (See Category 7); or (c) responses which mention changes in clothing (See Category 6).

We would figure out better ways to keep cool in the summer.
We would figure out better ways to keep warm in the winter.
Better air conditioners.
Need automatic ice freezer.
Future home would need more insulation against heat.
Have different types of houses.

6. CLOTHING CHANGES. (Responses indicating changes in clothing and wearing apparel).

We would have to wear too warm winter clothes.
We would have to wear cool summer clothes.
I'd go barefoot in the winter outside.
I wouldn't have to wear a coat so much.
We wouldn't have to buy such heavy winter coats.
We would need cooler clothes.
We would wear lighter clothing.
We would be wearing shorts all summer.
Year-round bikniis.
The type of clothing would change.
We wouldn't need boots except for rain.

7. BUSINESS, INDUSTRIAL AND ECONOMIC CHANGES (INCLUDING EMPLOYMENT). (Responses which specifically mention increased or decreased buying and selling of goods and services, responses which specifically mention cost of goods and services and responses which mention decline or expansion of business including increased or decreased employment opportunities for individuals or a class of individuals. Do not include responses which (a) mention only increased or decreased use of goods and services (See Categories 4 and 6) or (b) responses which refer to development of new goods and services or changes in present goods or services (See Category 5).

There would be no sale for sleds.
Everyone would buy air conditioners.
Swimming pool sales would go up.
The insect control would make lots of money because of the increase in insects.
Electricity rates would go up.
Insurance companies would lose money.
It would effect the sale of winter clothes for they would not be used very much.
Ice would be made and sold by the ton.
Ice skating rinks would be out of business.
People would not have to spend money on woolens.
Florida pushed out of winter tourist business.
Swimming pool owners would make a lot of money.
Ice cream salesmen would make a fortune.
The tickets (to the pool) might cost more.
Different occupations would be started.
People who have jobs only in winter would be out of work.
Everyone would buy cold drinks.

8. AGRICULTURAL, FOOD SUPPLY AND VEGETATION CHANGES. (Responses which mention changes in crops, flora and vegetation, changes in growing season, increased and/or decreased production of crops and changes affecting fish and livestock).

Different crops would probably have to be raised.
Crops might die in the summer.
The fertility of the soil would make this a rich farming area.
Soil would be of a different nature and different trees would be grown.
Corn would parch in summer.
Food would grow, grow, grow.
Less crops grown.
The growing season would be different.
Crops would have a longer growing season.
The grass would be green all year.
My mums wouldn't freeze.
The northern trees would die and southern shrubs would come in.
Have different trees.
Christmas trees would die.
Fish would die.
We would have some flowers.

9. RECREATIONAL AND CULTURAL ACTIVITIES CHANGES. (Changes in liesure time activities decline or expansion of modes of recreation and entertainment).

We could have more outside activity.
I could have more picnics.
We wouldn't be able to go skiing.
We could go swimming more.
We wouldn't be able to go skating on Crystal Lake Park lake.
We wouldn't throw snow balls.
More summer recreation.
Less winter sports.
It wouldn't be as much fun in the winter.
You could have squirt gun fights all year around.
Swimming pools would be more crowded.
In the summer it would be so hot that people would go North for their vacations.

10. MENTAL HEALTH, ABILITIES, AND SKILLS

We would be bored with the weather.
I'd get spring fever even worse than I do now.
People would gripe more.
My P. E. teacher would enjoy herself.
People would like it better.

11. EDUCATIONAL CHANGES. (Includes all changes which mention schools, teaching methods, changes in subject matter, changes which mention teachers, etc.)

It would be sometimes too hot to go to school.
In winter it would be easier to walk to school.
It would be easier to make it to first hour class in the winter.

12. MISCELLANEOUS

Some birds would be here all year.
Not as many bugs.
Bears might not hibernate during the winter.
A lot of our water would evaporate.
Water would be hot in summer.
Lakes would dry up.
I could sleep with my windows open.
Windows open all the time.
Santa Claus couldn't come in the snow very often.
Santa Claus would fade away.
Christmas just wouldn't seem right.
Have different living habits.
We wouldn't have to shovel snow.
Things would burn easier.
I'd need a year's supply of suntan lotion.

I. IRRELEVANT

I wouldn't like it.
The temperature would be hotter.
It would be 15 degrees hotter.
Couldn't drive a nail.

D. Hearing

1. PHYSICAL HEALTH AND ABILITIES. (Includes changes in physical well-being, in physical abilities, and changes that have direct implication for physical well-being.)

   More people would wear glasses because of using eyes constantly.
   Doctors would lose one method of detecting disease.

2. MENTAL HEALTH, ABILITY AND SKILLS.

   If it happened suddenly people would have trouble adjusting.
   The world wouldn't seem as interesting.
   People would become very unhappy.
   People would go crazy with the silence.
   Everyone would think everybody else was crazy.

3. BUSINESS, INDUSTRIAL AND ECONOMIC CHANGES. (Responses that indicate expansion or decline of a business or service, changes in cost of equipment and services; do not include responses pertaining to individuals or a class of individuals (See Category 4) or responses pertaining to changes or revision of equipment or development of new services and equipment (See Category 5).

   Radio stations would go out of business.
   Newspapers would get bigger.
   The hearing aid business would suddenly boom.
   It would cost everybody more.
   Cars would be made cheaper.
   Manufacturing would stop (lack of instruction).
   Things could not be built.

4. EMPLOYMENT. (Affecting the individuals or a class of individuals.)

   All music directors would lose their jobs.
   People would be jobless (singers, musicians, etc.)
   Musicians would be put out of business.
   Ear doctors would probably go out of business.

5. TECHNOLOGICAL CHANGES. (Changes and/or revisions in existing equipment or processes and development of new equipment and processes except when specific reference is made to education or schooling (See Category 7).

   New telephones would have to be developed.
   When we had to go to school we'd wake ourselves mechanically.
   A new warning signal would have to be made for driving.
   Movies would have to be made differently.
   TV would have to be changed somewhat.

6. CHANGES IN SOCIAL VALUES AND NORMS. (Change in the value that society places upon something; do not include changes in mode of behavior or changes in the frequency of doing something.)

   Great composers would be forgotten.
   Pantominists would be very popular.
   "Hearing" people would be considered strange.

7. EDUCATIONAL CHANGES. (Changes which mention schools, methods of teaching, changes in subject matter being taught, changes which mention teachers, etc.)

   Many schools would have to closed down.
   Teaching would have to be visual.
   It would be hard to continue school.
   Many hearing schools would have to be set up.
   A new method of teaching would have to be developed.
   Lack of qualified teachers.
   Sign language would be taught.

8. CHANGES IN RECREATION AND CULTURAL ACTIVITIES AND MODE OF AESTHETIC APPRECIATION. (Changes in leisure time activities, decline or expansion of modes of recreation or entertainment, changes in emphasis upon sense modalities in aesthetic appreciation, etc.)

   We would not be able to have concerts.
   We would not be able to listen to radio, TV or records.
   People would probably read more books.
   The conception of beauty and color would be greater.
   People couldn't play musical instruments requiring the use of the ear.
   No more dancing.
   No more music lessons.
   Silent movies again.

9. EQUIPMENT, MACHINERY AND INSTRUMENTS RENDERED OBSOLETE. (Changes in the frequency of use of objects, discontinuance of objects; do not include revisions or changes in existing equipment, objects, etc. (See Category 5.)

   Wouldn't be able to use TV, radios, phonographs or telephones.
   Horns, sirens, burglar alarms and fire alarms would no longer be useful.
   No use for record players.
   Telegrams couldn't be sent.
   No need for mufflers on cars.
   Pianos would grow extinct.

10. GENERAL BREAKDOWN OF COMMUNICATION AND DEVELOPMENT OF ALTERNATE MODES OF COMMUNICATION. (Statements of communication difficulties and problems and suggestions for alternate modes of communication, including emphasis upon sense modalities other than hearing.)

Steps would have to be taken to reorganize communication.
The only communication would be writing or sign language.
Everyone would have to learn the same language.
Pictures would become very important.
Everyone would yell.
We would have to learn a new language.
People could not convey ideas.
It would take a long time to communicate with another part of the world.
You could not communicate with others quite so well.
Eyesight would be more important.
The other senses would become more acute.

11. INCREASED RISK AND SPECIFIC DANGERS ARISING FROM LOSS OF HEARING.

Somebody might get hurt by not hearing a car coming.
We couldn't hear if anyone was getting hurt.
There wouldn't be any way to warn people of immediate dangers.
Boats couldn't hear fog horns.
It would be difficult for someone injured to get help.
Babies wouldn't be able to attract their mother's attention if they were in the next room.
Airplanes would have to be controlled by the pilot alone.
We'd have to lessen air traffic.

12. GENERAL AND SPECIFIC ADVANTAGES OF LOSS OF HEARING.

Maybe there would be peace because everyone would be trying to solve this problem.
People wouldn't worry about noise.
Wouldn't need soundproof rooms.
Communist countries might be on friendlier terms with the U.S.
Fewer arguments.
You could insult someone and they couldn't hear you.
People wouldn't fight so much.
Gossip would stop (for awhile).
Deaf people of before would be overjoyed.

13. GENERAL CATASTROPHE AND DISORGANIZATION.

There would be great confusion.
Everyone would die.
Everything would stop.
Everybody would panic.
Confusion would reign.
The world would first go into a panic.
Nobody would know what to do.
Havoc and disorder.
For years it would be a big mess.

14. LACK OF SOUND.

There would be no sound.
It would be a silent world.
It would be a pretty soundless world.
There wouldn't be any noise.

15. **MISCELLANEOUS RESPONSES.** (Responses that cannot be classified in any of the categories listed above but which are relevant to the problem.)

In writing all uses of sound as an adj. would be lost.
The vocal cords would disappear.
Over a period of millions of years the ear would disappear.
No one would need to yell at games.
People wouldn't clap or applaude.
People would pay more attention to newspapers.

I. **IRRELEVANT.** (Responses which are off the point, don't make sense, are illegible or incomplete; also extremely ambiguous responses.)

They couldn't hear.
People would be unattended.
We wouldn't be able to hear.
We couldn't walk.
Couldn't shop for food.
People couldn't work or play.

E. Pain

1. PHYSICAL HEALTH AND ABILITIES. (Includes changes in physical well-being and ability. However, there must be specific reference to a disease or disability affecting human beings. Do not include responses which (a) simply imply changes in physical well-being, (b) responses which mention simple loss of life but do not specify a disease or condition, and (c) responses concerning death due to drowning (See Category 2).

   People would not get enough sun, and therefore not be well.
   The climate would cause more illness.
   There would be epidemics, such as malaria, yellow fever, etc.
   More colds and sickness.
   Before dams were built, there would be starvation.

2. INCREASED RISK AND SPECIFIC DANGERS DUE DIRECTLY OR INDIRECTLY TO FLOODING. (Only for responses which mention loss of life due to drowning and responses which imply but do not specifically state something about physical well-being of human beings).

   Many people might be drowned.
   The Mississippi would overflow and many would drown.
   Many people would lose their lives.
   Water snakes would develop quickly to become a menace.
   People would have to sleep in mosquito nets.
   The dams might break loose if the rain was continuous.

3. MENTAL HEALTH, ABILITY AND SKILLS.

   People would tend to be grouchy.
   People would become depressed.
   Everybody would be cross.
   Children would be restless during the rainy season.

4. BUSINESS, INDUSTRIAL AND ECONOMIC CHANGES. (Includes responses indicating (a) expansion or decline of a business or service, (b) changes in general productivity, (c) changes in the cost of living. Do not include responses which specifically mention an individual or class of individuals (See Category 5) or responses dealing with changes in equipment or development of new equipment and artifacts (See Categories 7 and 8).

   Raincoat business would flourish.
   Many people would go bankrupt.
   Prices on overshoes would go up because of need for them.
   Illinois couldn't support as many people.
   Dairy farms would go out of business.
   Prices would be higher on vegetables, corn, etc.

5. EMPLOYMENT. (Changes affecting individuals or a class of individuals. The reference must be specific, i.e., responses mentioning "dairy farmers" would be included but responses mentioning "dairy farms" would not be included but would be placed in Category 4).

Lots of people would be out of work.
Many jobless.
Farmers couldn't make a living.
Many farmers would go broke.

6. FLOODING, MUD AND GENERAL SLOPPY CONDITIONS. (This category is for more or less global responses indicating that things would be wet, flooded, muddy, messy, etc. Also include responses which refer to flooding of streets, fields, sidewalks, etc. but which do not specifically mention damage as well as responses which mention the overflowing of rivers, lakes, streams, etc. However, do not include responses which mention the flooding of basements and buildings (See Category 7); responses which specifically mention damage done to streets, etc. (See Category 8); and responses which mention the filling of lakes, rivers and streams or which mention erosion (See Category 9).

There would be many floods.
Everything would be wet and muddy.
It would be a muddy mess.
Streams, rivers, etc., would overflow.
When it started raining so much the land would flood.
It would be awful wet.
Streets would probably become canals.
There would be more flooded fields.

7. DAMAGE DONE AND PREVENTIVE MEASURES: HOUSES AND BUILDINGS. (Responses which mention damage to houses and buildings, flooding of houses and buildings and preventive measures to be taken to waterproof or protect houses and buildings).

New types of housing would have to be built.
Houses would be built differently to withstand all the rain.
Houses would be built on stilts.
Different chimneys would be used.
Houses and other buildings would be ruined.
Buildings and houses would sink into the ground more.
Basements would be wet.

8. DAMAGE DONE AND PREVENTIVE MEASURES: PROPERTY OTHER THAN BUILDINGS. (Responses which mention preventive measures taken to alleviate general flooding, methods to reduce damage to streets and roads and responses which mention damage to streets, roads, sidewalks, etc.)

Special sewers would have to be put in cities.
Walks would have to be covered.
Better street gutters would be devised.
New dams would be built to hold the water for use in the dry season.
Much more drainage tile would be laid.
Streets would have to be cemented.
The streets would probably be in bad shape.

9. TOPOGRAPHICAL CHANGES. (Responses which mention the filling of lakes, rivers, etc., erosion and effects of erosion and changes of dry land forms to swamps, bays, etc. Do not include responses which refer to overflowing of lakes and rivers (See Category 6); responses which specifically mention damage to roads, buildings, etc. (See Categories 7 and 8) or responses which specifically pertain to agricultural problems (See Category 12).

Soil would erode.
There would be more streams and rivers.
There would be many gulleys and such, carved out by erosion.
Illinois wouldn't be the "Prairie State" any more.
Lake Michigan would get bigger.

10. PROBLEMS AND CHANGES IN TRANSPORTATION AND COMMUNICATION. (Responses which specifically indicate either a problem in transportation or communication or a solution to a transportation or communication problem. Do not include responses which mention flooding of streets and roads or damage to streets and roads but which do not specifically mention a transportation or communication problem (See Categories 6 and 8).

Transportation would be difficult.
TV and radio might be cut off.
Everyone would need boats for rain, cars for dry weather.
Shipping up the Mississippi would decline.
Highways would be few.
People out in the country would almost be cut off from civilization.

11. CHANGES IN CLIMATIC CONDITIONS. (Changes in temperature, humidity and general climatic changes.

It would be very sticky and humid all the time.
The seasons would change.
The humidity would be much more unbearable.
No droughts.
The remaining six months would be very dry.
Our countryside would be almost topic-like.
It would be hot.

12. CHANGES IN FLORA OTHER THAN DOMESTIC FOOD CROPS.

There would be much vegetation.
We would be overgrown with foliage.
Giant ferns and things like that would grow.
We might grow tropical plants.
Plants would grow to great height.

13. CHANGES AFFECTING AGRICULTURE AND GENERAL PROBLEMS IN FOOD SUPPLY.

Not as much food variety.
Much valuable livestock would be killed.
U.S. would have to look somewhere else for corn and soybeans.
The crops would be different (rice, etc.)

New crops would be developed to meet this climate.
The ground would be so wet that farmers wouldn't use it.
Corn might be grown with more yields.
There would be less cultivation.
Crops would be washed away.
There would be less farming.
There would be few gardens.
Surplus food would probably be distributed in Illinois.

14. EDUCATIONAL CHANGES. (Responses which include any mention of school or schooling. Do not include responses which mention damage done to school buildings or changes in school buildings (See Category 7)).

Swimming and boating might be school subjects.
The schools might have to close temporarily.
There wouldn't be any school.
You'd have to swim to school.

15. CHANGES IN RECREATIONAL AND CULTURAL ACTIVITIES. (Changes in leisure time activities, decline or expansion of modes of recreation and/or entertainment).

New types of entertainment would have to be found.
New indoor sports would be invented.
There'd be more swimming - it would become a favorite sport.
Indoor hobbies.

16. CHANGES IN CLOTHING AND ACCESSORIES. (Including responses relating to increased or decreased use of types of clothing, except where industrial or economic aspects are emphasized (See Category 4)).

Clothing would have more emphasis upon water resistance.
Raincoats more in demand.
People would carry umbrellas all the time.
We'd all wear swim suits.
Clothing styles might be completely changed.
There would be fashion shows for what to wear in the rain.

17. MOVEMENT AND SHIFT OF POPULATION.

People would move to higher ground.
The tops of hills would be the most populated places.
Not many people would move here.
Less people would live in Illinois.
Chicago would lose population.
The people might move.
We'd all move for six months.
People might move to other states.
Ohio's population would increase.

18. MISCELLANEOUS RESPONSES.

You couldn't go outdoors as much.
Everyone would use electric or gas clothes dryers.
A lot of swamp animals and insects would appear.
Our water supply would be replenished.

I. IRRELEVANT. (Responses which are off the point, which don't make sense, are illegible or incomplete; also extremely ambiguous responses).

III. PERSONAL SUBJECT REFERENCE vs. NON-PERSONAL SUBJECT REFERENCE

In addition to the breadth score, each response is to be judged separately on the following dimensions. A brief description of each of these categories and illustrations of responses for the various statements of alteration follows.

A. Personal Reference: To be included in this category the response must specifically indicate that the consequence is directly influencing either the subject himself, things in his immediate environment, or persons with whom he has some direct relationships in the course of his daily activities. Such statements might include items which influence, "My friends", "My teacher", "Our teacher", "Mother", "My school", or "My school building".

B. Non-Personal Reference: Responses in this category are those which influence persons other than the individual who is responding or his close associates. Statements concerning the effect of the alteration either specifically define other persons or imply its effect in other than a personal way.

The following examples contrast the personal versus non-personal dimension for all of the statements of alteration.

What Would Happen If Pills Were Developed Which Would Substitute For Food?

PERSONAL

1. I wouldn't be so hungry.
2. I would leave them alone.
3. Mother wouldn't have to feed my sister.
4. My mother could take it easy.
5. I'd never come home for meals.
6. I would sneak more than my share.
7. On Sunday I would want real food.
8. My mother could make our kitchen into another room.
9. My grandfather would quit farming.
10. I would eat only what I wanted to.

NON-PERSONAL

1. There wouldn't be any cooking.
2. A few shelves would replace ice boxes, pantries, etc.
3. It would change our food habits.
4. People would become thinner.
5. Farming would stop.
6. Kitchens smaller.
7. Increased traveling.
8. There would be great editorials about them.
9. Pills might cost more than real food.
10. We would need more liquids.
11. They would be easier to prepare.
12. Farmers would get new jobs.
13. You couldn't have snacks between meals.
14. Super markets may go out of use.
15. There wouldn't be any taste.
16. We wouldn't sit down at the table.
17. They would have to make a lot of pills.
18. One could carry a lot of food around with him.
19. No need for raising crops.
20. The food dealer would go out of business.

What Would Happen If Everyone Was Born With Three Fingers And No Thumb?

PERSONAL

1. I don't like it.
2. My teacher would look odd writing on the board.
3. Our hired man wouldn't do as much work.
4. I couldn't type as fast.
5. I'd be useless.
6. I couldn't hold my dog on his leash.
7. My teacher would have a hard time teaching me to write.
8. My books would drop easily.
9. I'd take longer to do things.
10. My aunt could not smoke so much.

NON-PERSONAL

1. You could not use the expression, "They're all thumbs."
2. Everybody would be butter fingers.
3. We wouldn't have as many things manufactured.
4. There wouldn't be much music.
5. Couldn't work in machine shops very well.
6. We would need new silverware.
7. We couldn't eat with our fingers.
8. It would look rather odd.
9. Pushbuttons had better be invented!
10. We probably would be in the Stone Age.
11. You couldn't hold things very sturdy.
12. You couldn't drink because you couldn't hold the glass.
13. You would have to change baseball gloves.
14. You might not live as long.
15. You couldn't write.
16. Everything would be harder to do.
17. They would always have slips.
18. We would have to take pills.
19. It would be hard to saw by hand.
20. It would be hard to paint.

What Would Happen If The Average Temperature For This Area Went Up 15° All Year Round?

PERSONAL	NON-PERSONAL
1. I would hate summer.	1. Resort areas would have more business.
2. I could not ice skate much.	2. More birds in winter.
3. I would wear a bathing suit all year.	3. Everyone would vacation in the Anartics.
4. My teacher would dismiss us early.	4. The animals would have their hair shaved off.
5. I'd learn to be a life guard.	5. We would grow citrus fruits.
6. I'd spend my summers in Alaska.	6. There wouldn't be greenhouses in the winter.
7. I'd make enough money to buy an air conditioner.	7. Storm windows wouldn't be necessary in winter.
8. My dog would pant more.	8. People would build houses with patios.
9. Our hogs would die in the heat.	9. Stores wouldn't carry as many warm clothes.
10. My father would quit farming.	10. Farmers wouldn't work as well in the heat.

What Would Happen To Illinois If It Rained Six Months Out Of The Year?

PERSONAL

1. I'd move.
2. My family would buy a boat.
3. My sisters would have to learn to swim.
4. My dog would drown.
5. I would be a lifeguard.
6. My dad would stay home.
7. I would buy a raft.
8. I would go fishing.
9. I'd invest in rainwear stock.
10. I'd buy hip boots.
11. I'd die.

NON-PERSONAL

1. Erosion.
2. We would have almost no seasons.
3. Rivers would overflow.
4. Animals would die.
5. People would leave Illinois.
6. Farms would be ruined.
7. Plants would die.
8. We would build canoes.
9. We would travel in boats.
10. World would be fish life.
11. People couldn't drive cars.
12. No more football games.
13. It would be bad on car brakes.
14. We would go swimming everyday.
15. Grass would rot.
16. People couldn't go to work.
17. The Mississippi would overflow.
18. Illinois-Inland sea.
19. U. S. Government would send relief.
20. We would wear rainproof clothes.

What Would Happen If Everyone Lived To Be About 200 Years Old?

PERSONAL

1. I would have many grandchildren.
2. I would have to go on many diets.
3. My mother would get tired of having children.
4. My father would become burdened with providing for the family.
5. I would be smarter.
6. I would travel over the entire world.
7. I would retire early and enjoy myself.
8. My hair could be dyed several times.
9. I would die in 2149.
10. I would take good care of my health as to remain healthy for that long.

NON-PERSONAL

1. Most of the people would be poor.
2. The people would use our resources too fast.
3. The world would be heavily populated.
4. Education would become limited.
5. There would be a food shortage.
6. Old folks homes would be crowded.
7. False teeth companies would become rich.
8. Life insurance company policies would change.
9. Everyone would be gray.
10. Your skin would shrink up like a prune.
11. Not enough Social Security for people.
12. No more fun because we'd all be too old.
13. Too many grown ups.
14. More housing problems.
15. You would be feeble.
16. Canes would sell good.
17. You wouldn't be called old at forty.
18. Too many would be unemployed.
19. More inventions would take place.
20. Doctors would make a million.

IV. POSING A PROBLEM vs. PRESENTING A SOLUTION

A. Posing a problem: Responses classified in this category are either a perception of a problem which the subject feels will evolve from the consequence, an extension of that problem to other areas of life, a restatement of the consequence, or a statement of the general disadvantage of such an alteration.

B. Presenting a Solution: This category contains all of the responses which give solutions to the problems which the respondent feels will result from the consequence. In many instances these problems are implied. In addition, responses signifying that the alteration in the environment results in some type of an advantage are placed in this category. It is not appropriate for the judge to evaluate the legitimacy of the problem nor whether the solution is feasible under present conditions.

The following examples for each alteration contrast these two categories.

What Would Happen If Pills Were Developed Which Would Substitute For Food?

PROBLEM	SOLUTION
1. Supermarkets may go out of use.	1. The pills could make pill boxes a large business.
2. Children would get hungry for food they like.	2. It wouldn't take as long to eat.
3. Babies would have trouble getting them down.	3. You wouldn't worry about being late for meals.
4. Restaurants would go out of business.	4. Good for outer space.
5. No more farms.	5. Get more vitamins.
6. Pills would be less appetizing to look at than food.	6. Beats carrying a pack!
7. We would turn lazy.	7. Take less storage.
8. Small children might play with them.	8. You might become slim.
9. The pills might get mixed up.	9. Eat anywhere and anytime.
10. Wouldn't have much fun shopping.	10. No food spoiling.
11. Pills might not be so good in value.	11. People could have more free time.
12. Farmers would loose importance.	12. Women would not have to cook.
13. Picnics wouldn't be fun.	13. No dishes.
14. People might forget to take them.	14. Food wouldn't cost so much.
15. We would be sick all of the time.	15. Lots of people would get a more well balanced diet.
16. We couldn't have fancy dinners.	16. You wouldn't worry about children spilling things.
17. There may not be enough vitamins.	17. You could have meals in bed easier.
18. The food canning industry would be ruined.	18. The baby could eat alone without getting messy.
19. People would all grow fat.	19. Children wouldn't carry lunches to school.
20. Pills might not be as easy to digest.	20. Trains wouldn't need dining cars.

What Would Happen If Everyone Was Born With Three Fingers And No Thumb?

PROBLEM

1. Have to invent another way of writing.
2. You couldn't wear gloves.
3. You couldn't eat very well.
4. Your hand would hold less.
5. Your grip would be weaker.
6. There would be no athletic games.
7. Wouldn't be able to play musical instruments.
8. It would be hard to smoke.
9. They couldn't lift things.
10. They would have less capabilities.
11. Couldn't fight too good.
12. You would have a hard time carrying luggage.
13. Lots of pleasures would be lost.
14. It would be hard to use a typewriter.
15. Work would slow down.
16. Things would be constantly dropping.
17. You couldn't work on sewing.
18. We couldn't turn on the TV or radio.
19. Less skilled work.
20. Less beauty.

SOLUTION

1. Wouldn't have to wash as many fingers.
2. Everything would be less complicated.
3. Push button machines would boom.
4. Glove companies would need less material.
5. We would only be able to count up to 6 on our fingers.
6. They would have to hold an object with both hands.
7. People couldn't scratch you as bad.
8. Babies could not suck their thumbs.
9. You might be able to buy man made thumbs.
10. The number system might be base 6.
11. Feet will become more useful.
12. There would be no need of cup handles.
13. We would have to change our handshake.
14. Ladies would not use so much finger nail polish.
15. We would have to take pills.

What Would Happen If The Average Temperature For This Area Went Up 15° All Year Round?

PROBLEM	SOLUTION
1. We would have a hard time getting food because soon everything would burn up.	1. We would need underground houses.
2. It would be hard to work.	2. We would need a good fire department.
3. Schools would cost more money to air-condition.	3. It would be easy to play in.
4. There would be more storms.	4. There would be almost no snow.
5. People would get sun strokes in the summer.	5. We would have more swimming pools.
6. Heavy clothing industries might close.	6. Trees would live longer.
7. It would get miserable in midsummer.	7. People could get out more.
8. Some people would spend a lot of money trying to keep cool.	8. In the winter you could grow crops.
9. In summer we would need more refrigeration.	9. People would need more salt.
10. There would be a lot of sickness.	10. There would be a longer growing season.
11. People wouldn't feel up to turning out goods.	11. Adults wouldn't have so many colds.
12. There would be more knats.	12. People wouldn't need electricity.
13. We would have heavy rainfall.	13. People would wear fewer clothes.
	14. Not as high heat bill.

What Would Happen If Everyone In The World Would Suddenly Lose Their Hearing?

PROBLEM

1. People couldn't understand each other.
2. More automobile accidents.
3. Communication would be poor.
4. The world would stop.
5. The telephones would be of no use.
6. You would have to write all things.
7. There would be more traffic accidents.
8. Blind people would have no means of communication.
9. There would be no more composers.
10. New teaching methods would be used.
11. World crises would be different.
12. A new system would have to be developed for fireman.
13. There would be no use for tape recorders.
14. Mass panic.
15. It would be boring.
16. We couldn't follow directions.
17. You couldn't consult people.
18. Jobs would be lost.
19. Scientists couldn't communicate.
20. It would drive someone insane.

SOLUTION

1. People's other senses would be much better.
2. People would use hand signals more.
3. There would be all special schools.
4. Gum chewing wouldn't bother others.
5. Reading would be more popular.
6. Telepathy would be used.
7. Ears would grow shorter.
8. No one would argue.
9. The price of typewriters would go down.
10. They would have peace and quiet.
11. You could say anything that you wanted to.
12. Jets would not have to muffle sounds.
13. Hearing aids would go up.
14. We would find a new way of communication.
15. People would use sight more.
16. Everyone would shout.
17. They would have to show things with pictures.
18. We would do like Betsy Ross did.
19. We would read people's lips.

What Would Happen To Illinois If It Rained Six Months Out Of The Year?

PROBLEM	SOLUTION
1. We would be flooded.	1. You would have plenty of money.
2. Animals would die.	2. We would build canals.
3. Schools would be destroyed.	3. Boats would sell.
4. It would be expensive.	4. We would live in houseboats.
5. Farms would be ruined.	5. Bigger lakes.
6. People might be injured or killed.	6. They would have to print paddling licenses.
7. Electricity would be cut off.	7. We'd raise rice in paddies.
8. Bridges would be washed out.	8. Illinois would be the center of attraction.
9. We couldn't go to the movies.	9. We would have baths everyday.
10. We would never see sunshine.	10. The price of umbrellas would go up.
11. Towns would be deserted.	11. We would be fishing all of the time.
12. Cars and buses wouldn't run.	12. Dams would be built higher.
13. Convertables wouldn't be very popular.	13. Chicago's stockyards would be on stilts.
14. Food would spoil.	14. We would move to higher land.
15. The flood might spread to other states.	15. We would have work for people on erosion projects.
16. People would become sick of water.	16. Lots of water to drink.
17. Our outdoor activities would be confined to half the year.	17. We'd always wear bathing suits.
18. It would be awful damp.	18. Invent a jet boat.
19. Extra large snowflakes.	19. Scientists would invent a giant sponge.
20. We would have a shortage of people.	

What Would Happen If Everyone Lived To Be About 200 Years Old?

PROBLEM	SOLUTION
1. The world would be overcrowded.	1. You could help people longer.
2. Many wheel chairs would be in demand.	2. Have a lot of activities.
3. There would be a food shortage.	3. The rocking chair business would boom.
4. Smaller minimum wages.	4. It would take you very long to go somewhere.
5. Many sick people.	5. More homes for the aged would be built.
6. Medical bills would be high.	6. Everyone would be wiser.
7. Cut down forests.	7. The world could go a lot further in science.
8. Unemployment.	8. South America, Africa, and other widernesses settled.
9. Longer prison terms.	9. Seas pushed back by using dikes.
10. Not enough farmland.	10. Wars would be good things - cut down population.
11. You couldn't vote until 40.	11. New industries.
12. Many suicides.	12. New games.
13. Taxes would be higher.	13. The body would be built differently.
14. No one would be playful.	14. Medicine would be greatly improved.
15. Prices would be increased.	15. Great books of memory would be written.
16. There would be more crime.	16. You would go to school for a longer term.
17. Some people would suffer longer.	17. Jungles would be cleared.
18. You'd be too old to walk.	18. We'd have to make more buildings.
19. The government would go broke trying to pay pensions.	19. Take a step a minute.
20. You would be married longer.	20. Invent a new razor.
	21. Somebody find a Fountain of Youth.

V. VAGUE STATEMENTS VERSUS PRECISE STATEMENTS

The fact that a portion of the environment will be changed is a foregone conclusion which is inherent in the statement of alteration. This dimension is concerned with evaluating the precision of the child's response in terms of how clearly the nature of the change is reported. This is not to be confused with the clearness of who is being influenced, but is concerned with what is the nature of the effect.

A. Vague Statements: Vague statements are those responses which express in global terms that an alteration will be brought about. Descriptive words or phrases such as ". . . will change," "new problems will arise," "new social patterns develop," or "something will be improved" are vague. Such statements do not specify the nature of what is being influenced nor how this will alter the status quo. The statement, "Houses would be changed" is vague in terms of how they will be changed. Whereas, in contrast, "No more kitchen stoves or shelves" specifically describe the nature of the object being altered. "New social pattern" is vague compared to the statement, "We would no longer eat with silverware but use our fingers," which describes the nature of how these changes will influence existing social mores. The best test to determine if a response is appropriate to this category is to ask "How?" If some answer would appropriately fit, the response is in all likelihood properly classified.

B. Precise Statements: Statements in this category are those which specify the nature of the object or that portion of the environment being altered. Such responses are not global and leave no doubt concerning precisely what is the essence of the change. In this case there must be some specific object described or some specific changes given by the respondent. The question "How?" does not seem appropriate for responses properly classified in this category since the response will clearly indicate the nature of how this change will influence a person or portion of society.

The following examples contrast the difference between these responses to various alterations should they come about.

What Would Happen If Pills Were Developed Which Would Substitute For Food?

VAGUE	PRECISE
1. You could get done faster.	1. There wouldn't be any cooking for housewives.
2. They would be easier to make.	2. You wouldn't get enough protein.
3. Some would be healthy.	3. It would be cheaper.
4. Babies wouldn't mature right.	4. They would taste better.
5. We wouldn't be healthy.	5. You would not have to cook them.
6. Pills could take over.	6. You would not have to wash pots.
7. Farmers would be out completely.	7. There might be a germ in the pill.
8. We wouldn't be as happy.	8. Stores would become smaller.
9. We would turn lazy.	9. Kids would have to drink more.
10. We would live better.	10. People wouldn't get very fat.
11. We would use more water.	11. Small children might play with them.
	12. There would be no more fun in eating.
	13. Large kitchens would be unnecessary.
	14. We'd have a full-course dinner in our pockets.
	15. Shorter lunch periods - more school time.
	16. Mothers wouldn't have to rush to get a meal ready.
	17. We would have to stop Girl Scout Cookies.
	18. Food crumbs wouldn't be on the floor.
	19. Pills would be less appetizing to look at than food.
	20. Children would get hungry for food they like.

What Would Happen If Everyone Was Born With Three Fingers And No Thumb?

VAGUE	PRECISE
1. Our clothing would be changed.	1. We would not tie shoes.
2. Our eating habits would be changed.	2. Could not tie knots.
3. You'd be a freak.	3. You couldn't use a gun.
4. Everything would go wrong.	4. You couldn't drive a car.
5. It might feel funny.	5. We couldn't use scissors.
6. People would learn to use fingers in different ways.	6. It would be hard to write.
7. People would have a hard time.	7. There would be less do-it-yourself kits made.
8. Dolls would look funny.	8. We would need new silverware.
9. We couldn't help.	9. We couldn't snap our fingers.
10. Our nation's progress would change.	10. Couldn't play an accordian too well.
	11. You can't open drawers or doors.
	12. Have trouble operating a boat, plane, or car.
	13. It would be hard to get dressed.
	14. We wouldn't have baton twirlers.
	15. Cars wouldn't be driven.
	16. Finger polish would go out of business.
	17. Police would have trouble finger printing.
	18. You could not milk a cow.
	19. Be like cartoon characters.
	20. No jugglers act.

What Would Happen If The Average Temperature In This Area Went Up 15° All Year Round?

VAGUE

1. The farmers would be happy.
2. Our clothing would be changed.
3. Our houses would be changed.
4. Our hobbies would change.
5. We would partake in different sports.
6. It would be no good.
7. My dog wouldn't like it.
8. All cars would have trouble.
9. School would be awful.
10. Things would be changed.
11. My luck would change.
12. Our lives would be threatened.

PRECISE

1. Lots of cars wouldn't need antifreeze.
2. Not so many people would go to Florida.
3. There would be lots of moisture in the air.
4. More air conditioning needed in summer.
5. Not as many snowplows -- less taxes.
6. Crops would die.
7. Seasons would be longer.
8. School semesters would be shorter.
9. Sidewalks would be too hot to play on.
10. Spring would start earlier.
11. The winters would not be severe.
12. Would not work or play as hard in summer.
13. Rain would be most of the percipitation.
14. Everybody would be brown from suntan.
15. All the water would evaporate.

What Would Happen If Everyone In The World Would Suddenly Lose Their Hearing?

VAGUE

1. The people wouldn't know what to do.
2. The world would vanish soon.
3. The world would be backwards.
4. Everyone would panic.
5. New ways of living.
6. New teaching methods.
7. Anger expressed in another way.
8. World crisis would be different.
9. Industry and civilization at a standstill.
10. We'd go crazy.
11. Mass panic.
12. Animals would take over the world.
13. Their civilizations would go down.
14. People would be lost.
15. Nothing for emergencies.
16. There would be world peace.

PRECISE

1. We would have to write.
2. We would have to learn lip reading.
3. Airplanes would be dangerous because of no communication.
4. New babies wouldn't learn to talk.
5. There would have to be a larger production of hearing aids.
6. No more telephones.
7. Televisions would have to be changed so that pictures would tell the story.
8. It would be more necessary to write well.
9. There would be no music.
10. Boys and girls could not learn.
11. You couldn't have oral exams.
12. Indians would be teachers.
13. Books would be read more.
14. Foxes would steal chickens.
15. Nixon wouldn't hear if the people would want him for president.
16. They couldn't hear a car coming.
17. More auto. accidents.
18. We would have to learn and teach by writing.

What Would Happen To Illinois If It Rained 6 Months Out Of The Year?

VAGUE	PRECISE
1. You wouldn't be able to do much.	1. There would be floods.
2. People would have a hard time to live here.	2. The population would drop cause most people would move.
3. We'd be washed off the map.	3. Dams would break.
4. People would not pay.	4. The cows couldn't eat grass.
5. No way to beat it.	5. Many people would drown.
6. World wide trouble.	6. Drain sewers would back up.
7. Minerals would be lost.	7. You couldn't take out your garbage.
8. Wouldn't be good for us.	8. The sun would be a blessing.
9. The population would change.	9. Illinois would be declared a disaster area.
10. Standards of living might change.	10. There would be no schools.
11. Schools would go accordingly.	11. You would have to know how to swim.
12. Historical background would be different.	12. We would live in houseboats.
13. Whole map changed.	13. We would have 5 feet of water all of the time.
14. Emergency organizations trying to do work.	14. We would go ice skating in the winter.
15. Everyone would be happy.	15. We could not drive nor ride bikes.
	16. Hazardous driving.
	17. It would be a water route from the great lakes.
	18. We would never have a shortage of water.
	19. We would never see land.
	20. Basements would be flooded.

What Would Happen If Everyone Lived To Be About 200 Years Old?

VAGUE	PRECISE
1. It would be a great change.	1. We would have gray hair.
2. You would have to change ways of life.	2. Kennedy would be president longer.
3. It would be a mess.	3. A lot of people would be on Social Security.
4. We would need more room.	4. You would be feeble.
5. They wouldn't be able to do anything.	5. Schools would be crowded.
6. There would be too many hazards.	6. More housing problems.
7. There wouldn't be enough room.	7. Bigger newspaper.
8. More care.	8. People wouldn't be able to get around.
9. Everyone would be sort of crazy.	9. No more fun because we would all be too old.
10. No one would think as well.	10. Not enough Social Security for old people.
11. No one would be happy.	11. About 50 people would be living in one house.
12. Retirement laws changed.	12. No olympic runners.
13. Ages would not change as fast.	13. People undernourished.
14. We would be squashed.	14. We would need more schools.
	15. There would be a food shortage.
	16. The people would be using our resources too fast.
	17. Most of the people would starve.
	18. There would be rare furniture and antiques.
	19. The world would go a lot further into science.
	20. People would be grouchy.

Name____________________________

CONSEQUENCES SCORING

	Personal	Non-Personal	Problem	Solution	Vague	Precise
1.						
2.						
3.						
4.						
5.						
6.						
7.						
8.						
9.						
10.						
11.						
12.						
13.						
14.						
15.						
16.						
17.						
18.						
19.						
20.						

APPENDIX C

GENERAL DIRECTIONS FOR SCORING SENTENCE COMPLETION TEST

APPENDIX C

I. GENERAL DIRECTIONS FOR SCORING SENTENCE COMPLETION TEST

1. Read over entire protocol.

2. Assign each response to an appropriate category or categories on the attitude scale. The major headings are:
   a. Child's attitude concerning his own abilities.
   b. Child's attitude concerning other things.
   c. Child's attitude concerning other people.
   d. Child's view of how others see him (anything concerned with his view of how others see other people or other things cannot be classified.)

3. Reread the responses assigned to each category separately. Evaluate each category as a separate unit using the following guidelines as general criteria:
   a. Weight is assigned to each category on the basis of: (1) The strength of the statement which is made (e.g. superlatives given by child ++), (2) The relative number of statements assigned to each category with particular attention given to the number of open-ended stems.
   b. Since these categories are not discrete, there will be instances of overlap between the scores. Decision to give two (or more) scores to a category is made on the basis of:
      1. ambivalence (e.g., ±)
      2. tendency toward or from neutrality along with statements of positive or negative valence should be scored either +N or N-.
      3. A few statements of one valence of great strength along with many statements of another valence of relatively weak strength; vice versa also. (used with great discernment)

Special Instances:

1. Statements indicating envy or worry by the child are to be considered as showing positive attitudes (either + or ++) for other things or other people.

2. Superlatives (e.g., best, most, greatest) given by the child at scored ++ except when they seem clearly to be clichés rather than genuine attitudes or feelings (as "Creativity is wonderful." +)

3. Statements about death and occupations do not necessarily relate to future projections.

4. The statement, "I am ashamed of myself," is to be evaluated as either internal control or social self but not both. The choice of a category depends on how the individual scorer sees the statement in context with other responses.

5. The statement, "When I make a mistake I try to correct it," is evaluated as (N) in the internal control category.

6. The Fears and Anxieties in Environment category refers to fears and anxieties outside of the school environment.

7. Parents mentioned as pairs, as "My parents are great," are rated under the Family category and not under the separate categories of Mother and Father.

8. Statements signifying concern about school performance are to be evaluated (--) in School Performance (IE) and (+) in attitude toward School as an institution (IIC).

9. Statements about shame are generally in the social self category.

10. Statements of teasing are evaluated (--) except when a distinct liking is evident.

11. General statements about ability are to be put into the ability category (Category I) most frequently used by the child.

12. Statements about flunking the Sentence Completion Test are scored (--) School Performance.

Unclassifiable__________ Name____________________

Scoring Sheet - Sentence Completion

ATTITUDES

I - Views his own abilities

A - Intelligence__________
++ + N - --

B - Social__________
++ + N - --

C - Physical__________
++ + N - --

D - Internal Control of impulses__________
++ + N - --

E - School Performance__________
++ + N - --

II - Views other things

A - Fears and anxieties in environment__________
++ + N - --

PERSONAL__________ SOCIAL__________

B - Education training__________
++ + N - --

C - School in present tense__________
++ + N - --

D - Religion__________
++ + N - --

E - Past experiences__________
++ + N - --

F - Future projections__________
++ + N - --

G - Completion__________
++ + N - --

H - Work__________
++ + N - --

I - Recreation__________
++ + N - --

J - Happiness__________
++ + N -- --

K - Creativity__________
++ + N - --

III - Views other people

A - Family__________
++ + N - --

B - Mother__________
++ + N - --

C - Father__________
++ + N - --

D - Sibs__________
++ + N - --

E - Other people__________
++ + N - --

F - Same sex__________
++ + N - --

G - Opposite sex__________
++ + N - --

H - Teacher__________
++ + N - --

IV - How he thinks others view him

A - Family__________
++ + N - --

B - Mother__________
++ + N - --

C - Father__________
++ + N - --

D - Sibs__________
++ + N - --

E - Other people__________
++ + N - --

F - Same sex__________
++ + N - --

G - Opposite sex__________
++ + N - --

H - Teacher__________
++ + N - --

Occupational choice__________

	Circle One	Circle One
Wishes:	1. Small scale	1. Personal
	2. Large scale	2. Social

II. CATEGORIES

A. The Child's View of His Own Abilities --the raw material--that he has to work with.

1. Intellectual Self: deals with the expressed attitudes of the child relative to how he feels about his own academic and intellectual ability.

Examples:
(1) I am afraid I'm pretty stupid.
(2) When I make a mistake I can never figure out why.
(3) My mind is always active.
(4) To be creative is easy for me.
(5) My imagination is excellent.

2. Social Self: deals with the expressed attitudes of the child relative to how he feels about his own abilities in social interchange. Quite often a ⊖ Social Self and a ⊕ Other People will be given for the same response. For example, the statement, "I wish that I could be well liked," indicates a ⊖ valence for own ability and a ⊕ valence for Other People.

Examples:
(1) I envy people who can make friends.
(2) My greatest trouble is I can't make friends.
(3) Secretly I wish I could have more friends.
(4) Friends are what I would like to make more easily.
(5) I am afraid it is easy for me to make friends.

3. Physical Self: deals specifically with the child's expressed attitudes concerning his feelings about his own physical appearance and/or ability in skills requiring physical prowess. This is not to be confused with expressions of likes or dislikes about play activities unless expressions of ability are made. Statements concerning appearance are also a part of this category.

Examples:
(1) I am very pretty.
(2) My looks could be much better.
(3) My mind is 9 pounds in weight.
(4) Secretly I wish I could play football better.
(5) My greatest trouble is I can't make the team.

4. Internal Control of Own Impulses: deals specifically with the child's expressions concerning his own ability to control his feelings, actions, or impulses. There may be concern expressed, but in any case it is concern about his own behavior what he is doing.

Examples: (1) My greatest trouble is nothing.
(2) I can't understand what always makes me bite my nails.
(3) I am sorry I can't control my temper.
(4) I can't understand why I watch TV instead of doing my homework.

5. School Performance: deals specifically with the expressions of the child relative to his feelings about HIS present school performance or achievement.

Examples: (1) My greatest trouble is that I'm flunking history.
(2) Secretly I wish that I was doing better in school.
(3) Secretly I wish that I could pass this test.

B. The Child's View of Other Things With Which He Deals

1. Fears and Anxieties: deals specifically with the expressions of the child relative to matters in the environment of which they have no control and which seem to be demonstrated by fears or anxieties in the child's statements.

Examples: (1) My greatest fear is W.W. III.
(2) Death scares me - is inevitable, etc.
(3) Many of my dreams are nightmares and keep me awake.
(4) My greatest longing is not to have to take math in school.

2. Education-Training: deals with expressions by the child relative to education and/or training in a global sense. The major concern here is with general academic affairs which is not peculair to any single academic institution.

Examples: (1) My greatest concern is getting a college education.
(2) The training for a college professor is tough.
(3) My greatest ambition is to have a college education.
(4) I am very much interested in science and math.
(5) Secretly I wish to have a good education.
(6) My education is important to me.

3. School: deals specifically with expressions of the child relative to school as an institution and the present school situation excluding present personal school achievement.

Examples: (1) I feel most proud of the school I go to.
(2) To be creative in school is necessary.
(3) School is fun (or dull).
(4) I am ashamed of the school I go to.

4. Religion: deals with expressions of the child relative to God or religion.

Examples:
(1) God is with me and everyone.
(2) Religion is something that everyone must have.
(3) Death is the entrance into the life hereafter.
(4) God is necessary.
(5) I feel most proud of my Sunday school attendance.
(6) Religion is good but not for me.

5. Past Experience: deals specifically with attitudes concerning previous childhood experiences of a personal nature.

Examples:
(1) My childhood has been great.
(2) My greatest trouble is my poor childhood experiences which I can't forget.
(3) I am afraid I haven't had a very good start in life.
(4) My childhood started when I was young.
(5) I am afraid that my childhood was poor.

6. Future Projections: deals with expressions by the child relative to projected experiences of an adult nature but not necessarily occupational or having to do with death.

Examples:
(1) My future is undecided.
(2) I am afraid that my childhood will end up in a dull life.
(3) My future is clear, cloudy, not bright, etc.
(4) My chief worry is that I want to be a doctor.
(5) Secretly I wish to become a scientist.

7. Competition: deals with expressions of the child relative to competitive experiences within and outside the school environment.

Examples:
(1) Competition is useless.
(2) My greatest trouble is competition.
(3) I like best competition.
(4) Competition is great.

8. Work: deals with concepts which are the antithesis of play including objects of work aside from homework.

Examples:
(1) Work is for the birds.
(2) Hard work is fun.
(3) My greatest trouble is work.
(4) I want to know when I can quit work.
(5) Secretly I wish I was old enough to go to work.

9. Recreation: deals with concepts which are the antithesis of work including object of play. Cuts across all categories.

Examples:
(1) I feel most proud of myself when I win at sports.
(2) My greatest ambition is to play ball tonight.
(3) It is fun to play.
(4) I am sorry I play so much.
(5) My worst problem is that I don't play enough.
(6) It is fun to watch T.V.
(7) My greatest longing is to read more books.

10. Happiness: deals with the general picture of happiness and cuts across all categories.

Examples:
(1) I can't understand why I love everyone.
(2) It is fun just to be alive.
(3) I am sorry that I'm living at this time.
(4) My greatest ambition is nothing.
(5) There are times when I'm very unhappy.

11. Creativity: deals with the concept and not with the individual's ability or inability to be creative.

Examples:
(1) To be creative is wonderful.
(2) To be creative is hard.
(3) To be creative is useless.
(4) To be great is to be creative.

C. The Child's View of Other People

1. Family: deals with expressed attitudes concerning the family structure, environment, interactions, activities, and members.

Examples:
(1) Our family is very happy.
(2) I feel most proud of my family, dogs, cats, etc.
(3) I am sorry our family fights so much.
(4) My greatest ambition is to leave my family and have my own apartment.
(5) At home I am happy.
(6) My parents are grand.

2. Mother: deals with expressed attitudes of the child toward his mother.

Examples:
(1) My mother is great.
(2) My mother is sick.
(3) My mother is a pain in the neck.
(4) My mother is fun.
(5) I am ashamed that my mother is so fat.

3. Father: deals with expressed attitudes of the child toward his father.

Examples:
(1) My father is intelligent.
(2) My father is a good guy.
(3) I am ashamed of my father.
(4) At home my father is a clown.
(5) I like best my dad.

4. Sibs: deals with the expressed attitudes of the child toward his sibs.

Examples:
(1) I envy my brother.
(2) I feel most proud of my sister.
(3) My worst enemy is my sister.
(4) My chief worry is my sister.

5. Other People: deals specifically with the child's expressions related to friendship and his attitudes toward others. The difference between Other People and Social Self is the difference between wanting friendship or being attracted toward other (Other People) and the perception of the individual regarding his ability to get and hold frinds (Social Self). There are instances where a response will fit into both of these categories.

Examples:
(1) Friends are fun.
(2) Secretly I wish I had more friends.
(3) To be great is to be popular.
(4) There are times when I want to be around people.
(5) I am afraid that I have too many friends.

6. Same Sex:

Examples:
(1) Boys like to fight.
(2) Girls are talkers.

7. Opposite Sex:

Examples:
(1) Boys like to fight.
(2) Girls liked to be teased.

8. Teacher: deals with the expressions of the child regarding his attitudes toward his teacher.

Examples:
(1) My teacher is a dud.
(2) My teacher is OK.
(3) My worst enemy is my teacher.
(4) My teacher is Mr. Jones.
(5) Secretly I wish there were no teachers.

D. The Child's View of How He Thinks Others See Him

Each of these categories deals with the child's perception of how he thinks other people view him. The following examples for each category are illustrations of the types of responses expected.

1. Family:

Examples:
(1) Our family thinks I'm nuts.
(2) I am afraid I'm the black sheep in my family.
(3) I want to know why my family is so interested in me.

2. Mother:

Examples: (1) My mother loves me.
(2) My mother thinks I'm great.
(3) I am afraid my mother doesn't like my actions.

3. Father:

Examples: (1) My father thinks that I'm pretty smart.
(2) My father is afraid I'll run away.
(3) I want to know why my father doesn't like me.

4. Sibs:

Examples: (1) There are times when my brother wants to drop me on my head.
(2) Secretly I wish my brother would think more highly of me.

5. Other People:

Examples: (1) Most people don't like me.
(2) Most people think I'm good looking.
(3) Most people think I'm smart.

6. Same Sex:

Examples: (1) Boys don't like me.

7. Opposite Sex:

Examples: (1) Girls avoid me.

8. Teacher:

Examples: (1) My teachers think I'm too loud.
(2) My greatest trouble is that my teachers don't like me.
(3) I am sorry that my teachers are disappointed in my schoolwork.

E. Protocol I

1. My schoolwork is triing.
2. My future to be a teacher.
3. I want to know how you can learn science.
4. Our family has seven in it.
5. The training I get at home is good.

6. Most people accept cleanliness as a bad habit.
7. Money often comes from bank robberies.
8. Hard work is good for you.
9. Friends are Ginny and Chyrstal.
10. My mother is works.
11. There are times when I am sick.
12. Eating is my bad habit.
13. My mind is always full of many different things.
14. I sleep nine hours.
15. My greatest longing is to have a $50,000 home.
16. God is the most important thing in my life.
17. To be great is something nice.
18. My imagination is large.
19. Boys usually are mean.
20. I am afraid of dogs.
21. My greatest trouble is heaviness.
22. To be creative is wonderful.
23. Many of my dreams are of New York City.
24. Secretly I wish to be beautiful.
25. My stomach is too big.
26. I cannot understand what makes me mad at myself.
27. Most people don't eat properly.
28. My father is a postman.
29. Religion to understand of the church.
30. My worst disposition is in the morning.
31. I am very intelligent I hope.
32. My childhood has been happy.

33. Competition is great fun.

34. I envy Ginny.

35. My looks are nice.

36. The dark somethink scares me.

37. My chief worry is getting an A in Science.

38. Fighting is for boys.

39. Children are adorable.

40. I feel most proud of my parents.

41. Girls usually are sweet.

42. Death is a thing we all must face.

43. My greatest ambition is to be a teacher.

44. When I make a mistake I feel awful.

45. I like best babysitting.

46. My teacher is a joker.

47. I am sorry to hurt anyone feelings.

48. At home I do the housework.

49. It is fun to play with smaller children.

50. My head is hard.

51. I am ashamed of some grades.

52. My education into college.

If I could have any 3 wishes - I would wish for:

1. I would wish for $10,000 so my family could get anything they want.

2. A new baby sister.

3. Straight A's from now on.

Protocol I
Scoring Sheet - Sentence Completion

ATTITUDES

I - Views his own abilities

A - Intelligence 13, 18, 31
++ [✓ +] N - --

B - Social
++ + [✓ N] - --

C - Physical 11, 21, 24, 25, 35, 50
++ + [✓ N -] --

D - Internal Control of impulses 12, 26, 30, 44
++ + N [✓ -] --

E - School performance 37, 51
++ + N [✓ -] --

II - Views other things

A - Fears and anxieties in environment 20, 36, 42
++ + [✓ N -] --

PERSONAL ✱ SOCIAL

B - Education training 52
++ [✓ + N] - --

C - School in present tense 1, 3, 51
++ + N [✓ -] --

D - Religion 16, 29
[✓ ++] + N - --

E - Past experiences 32
++ [✓ +] N - --

F - Future projections 2, 15
++ [✓ +] N - --

G - Competition 33
++ [✓ +] N - --

H - Work 8, 45, 48
++ [✓ +] N - --

I - Recreation 49
++ [✓ +] N - --

J - Happiness 32
++ [✓ +] N - --

K - Creativity 22
++ [✓ +] N - --

Unclassifiable 6, 7, 14, 17, 23, 43

III - Views other people

A - Family 4, 5, 40
++ [✓ + N] - --

B - Mother 10
++ + [✓ N] - --

C - Father 28
++ + [✓ N] - --

D - Sibs
++ + [✓ N] - --

E - Other people 27, 39, 47, 49
++ [✓ + N] - --

F - Same sex 9, 34, 41
++ [✓ +] N - --

G - Opposite sex 19, 38
++ + N [✓ -] --

H - Teacher 46
++ + [✓ N] - --

IV - How he thinks others view him

A - Family
++ + N - --

B - Mother
++ + N - --

C - Father
++ + N - --

D - Sibs
++ + N - --

E - Other people
++ + N - --

F - Same sex
++ + N - --

G - Opposite sex
++ + N - --

H - Teacher
++ + N - --

Wishes:

Circle one	Circle one
[✓ 1.] Small scale	[✓ 1.] Personal
2. Large scale	2. Social

Occupational choice

F. Protocol II

1. My schoolwork is good.
2. My future I look forward to.
3. I want to know how to teach school.
4. Our family is combined of four persons.
5. The training of a dog is hard.
6. Most people accept life as it is.
7. Money often doesn't come easy.
8. Hard work is not my speciality.
9. Friends are not easy to find.
10. My mother is 34 years old.
11. There are times when I would like to get rid of people.
12. Eating is something I do often.
13. My mind is sometimes asleep.
14. I sleep in my bed.
15. My greatest longing is to become a teacher.
16. God is a great person.
17. To be great is a wonderful thing.
18. My imagination is sometimes to vivid.
19. Boys usually like to eat.
20. I am afraid of snakes.
21. My greatest trouble is practicing my music.
22. To be creative you must have an imagination.
23. Many of my dreams are about marriage.
24. Secretly I wish I could marry someday.
25. My stomach is sometimes nervous.

26. I cannot understand what makes me so frightened of the dark.
27. Most people don't like homework.
28. My father comes from Texas.
29. Religion is a good thing.
30. My worst enemy is a person who cheats.
31. I am very temperamental.
32. My childhood was very gay.
33. Competition I do not like.
34. I envy my girlfriend.
35. My looks are not to good.
36. The dark frightens me.
37. My chief worry is school.
38. Fighting I do with my sister.
39. Children I love to take care of.
40. I feel most proud of my new bedroom.
41. Girls usually like to primp.
42. Death scares me a lot.
43. My greatest ambition is to be a teacher.
44. When I make a mistake I try to correct it.
45. I like best milk and cheese.
46. My teachers are all very nice.
47. I am sorry if I don't do my homework.
48. At home I feel comfortable.
49. It is fun to be with other people.
50. My head sometimes is foggy.
51. I am ashamed of some of my grades.
52. My education is a serious thing.

If I could have any 3 wishes - I would wish for:

1. Health and Happiness to everyone.
2. My family could always have everything they wanted.
3. I could get through college and get a good job.

Protocol II
Scoring Sheet - Sentence Completion

ATTITUDES

I - Views his own abilities

A - Intelligence 13, 18, 50
++ + [✓ N -] --

B - Social 9
++ + N [✓ -] --

C - Physical 25, 35
++ + N [✓ -] --

D - Internal Control of impulses 21, 25, 26, 31, 44
++ + N [✓ -] --

E - School performance 1, 51
++ [✓ +] N [✓ -] --

II - Views other things

A - Fears and anxieties in environment 20, 26, 36, 42
++ + N - [✓ --]

PERSONAL * SOCIAL ______

B - Education training 52
++ [✓ +] N - --

C - School in present tense 37
++ [✓ +] N - --

D - Religion 16, 29
++ [✓ +] N - --

E - Past experiences 32
++ [✓ +] N - --

F - Future projections 2, 15, 24, 43
++ [✓ +] N - --

G - Competition 33
++ + N [✓ -] --

H - Work 8
++ + N [✓ -] --

I - Recreation ______
++ + [✓ N] - --

J - Happiness 11, 38, 49
++ [✓ +] N - --

K - Creativity 18, 22
++ + [✓ N] - --

Unclassifiable 3, 5, 7, 12, 14, 17, 23, 40, 45, 47

III - Views other people

A - Family 4, 48
++ [✓ + N] - --

B - Mother 10
++ + [✓ N] - --

C - Father 28
++ + [✓ N] - --

D - Sibs 38
++ + N [✓ -] --

E - Other people 6, 9, 16, 27, 30, 39, 49
++ [✓ +] N [✓ -] --

F - Same sex 34, 41
++ [✓ + N] - --

G - Opposite sex 19
++ + [✓ N] - --

H - Teacher 46
++ [✓ +] N - --

IV - How he thinks others view him

A - Family ______
++ + [✓ N] - --

B - Mother ______
++ + [✓ N] - --

C - Father ______
++ + [✓ N] - --

D - Sibs ______
++ + [✓ N] - --

E - Other people ______
++ + [✓ N] - --

F - Same sex ______
++ + [✓ N] - --

G - Opposite sex ______
++ + [✓ N] - --

H - Teacher ______
++ + [✓ N] - --

Occupational choice ______

Wishes:

Circle one	Circle one
1. Small scale	[✓ 1.] Personal
[✓ 2.] Large scale	2. Social

APPENDIX D

DIRECTIONS FOR SEMANTIC DIFFERENTIAL

APPENDIX D

I. DIRECTIONS FOR SEMANTIC DIFFERENTIAL

Words mean different things to different people. Here we are interested in having you judge words against a series of word pairs. In taking this test, please make your judgements on the basis of what these things mean to you. On each page of this booklet you will find a different word to be judged and beneath it a set of word pairs. You are to rate the word on each of these word pairs in order.

Here is how you are to use these word pairs: (suppose you want to describe a basketball game). If you feel that it is very closely related to one end of the word pairs you should place your check-mark as follows:

fair __X__ _____ _____ | _____ _____ _____ unfair

or

fair _____ _____ _____ | _____ _____ __X__ unfair

If you feel that it is closely related to one or the other end of the word pair, but not extremely so, you should place your check-mark as follows:

strong _____ __X__ _____ | _____ _____ _____ weak

or

strong _____ _____ _____ | _____ __X__ _____ weak

If the word you are describing seems only slightly related to one side as opposed to the other side, then you should check as follows:

active _____ _____ __X__ | _____ _____ _____ passive

or

active _____ _____ _____ | __X__ _____ _____ passive

The direction toward which you check, of course, depends upon which of the two ends of the scale seem most characteristic of the thing you're judging.

IMPORTANT: (1) Place your check-mark in the middle of spaces, not on the boundaries:

This: _____ __X__ _____ | not this: _____ _____ X_____

(2) Be sure you check every word pair for every word -- do not omit any.

(3) Never put more than one check mark on a single word pair.

Sometimes it may seem to you that neither word in the word pair is related to a meaning or feeling you have about the word at the top of the page; nevertheless, we would like you to make the best choice in one direction or the other. Don't worry about how you checked earlier items in the test. Make each item a separate and independent judgment. Work at a fairly high speed. Don't worry about individual items. It is your first impressions, the immediate "feelings" about items, that we want. On the other hand, please do not be careless, because we want your true impressions.

Describe: MOTHERS

1. ugly ____ ____ ____ | ____ ____ ____ beautiful
2. hardworking ____ ____ ____ | ____ ____ ____ lazy
3. hazy ____ ____ ____ | ____ ____ ____ clear
4. smooth ____ ____ ____ | ____ ____ ____ rough
5. sad ____ ____ ____ | ____ ____ ____ happy
6. aggressive ____ ____ ____ | ____ ____ ____ withdrawn
7. worthless ____ ____ ____ | ____ ____ ____ valuable
8. good ____ ____ ____ | ____ ____ ____ bad
9. slow ____ ____ ____ | ____ ____ ____ fast
10. calm ____ ____ ____ | ____ ____ ____ upset
11. unimportant ____ ____ ____ | ____ ____ ____ important
12. smart ____ ____ ____ | ____ ____ ____ stupid
13. unfair ____ ____ ____ | ____ ____ ____ fair
14. not guilty ____ ____ ____ | ____ ____ ____ guilty

Describe: **FATHERS**

1. ugly ____ ____ ____ | ____ ____ ____ beautiful
2. hardworking ____ ____ ____ | ____ ____ ____ lazy
3. hazy ____ ____ ____ | ____ ____ ____ clear
4. smooth ____ ____ ____ | ____ ____ ____ rough
5. sad ____ ____ ____ | ____ ____ ____ happy
6. aggressive ____ ____ ____ | ____ ____ ____ withdrawn
7. worthless ____ ____ ____ | ____ ____ ____ valuable
8. good ____ ____ ____ | ____ ____ ____ bad
9. slow ____ ____ ____ | ____ ____ ____ fast
10. calm ____ ____ ____ | ____ ____ ____ upset
11. unimportant ____ ____ ____ | ____ ____ ____ important
12. smart ____ ____ ____ | ____ ____ ____ stupid
13. unfair ____ ____ ____ | ____ ____ ____ fair
14. not guilty ____ ____ ____ | ____ ____ ____ guilty

Describe: SCHOOL

1. ugly ____ ____ ____ | ____ ____ ____ beautiful
2. hardworking ____ ____ ____ | ____ ____ ____ lazy
3. hazy ____ ____ ____ | ____ ____ ____ clear
4. smooth ____ ____ ____ | ____ ____ ____ rough
5. sad ____ ____ ____ | ____ ____ ____ happy
6. aggressive ____ ____ ____ | ____ ____ ____ withdrawn
7. worthless ____ ____ ____ | ____ ____ ____ valuable
8. good ____ ____ ____ | ____ ____ ____ bad
9. slow ____ ____ ____ | ____ ____ ____ fast
10. calm ____ ____ ____ | ____ ____ ____ upset
11. unimportant ____ ____ ____ | ____ ____ ____ important
12. smart ____ ____ ____ | ____ ____ ____ stupid
13. unfair ____ ____ ____ | ____ ____ ____ fair
14. not guilty ____ ____ ____ | ____ ____ ____ guilty

Describe: STUDENT

1. ugly ____ ____ ____ | ____ ____ ____ beautiful
2. hardworking ____ ____ ____ | ____ ____ ____ lazy
3. hazy ____ ____ ____ | ____ ____ ____ clear
4. smooth ____ ____ ____ | ____ ____ ____ rough
5. sad ____ ____ ____ | ____ ____ ____ happy
6. aggressive ____ ____ ____ | ____ ____ ____ withdrawn
7. worthless ____ ____ ____ | ____ ____ ____ valuable
8. good ____ ____ ____ | ____ ____ ____ bad
9. slow ____ ____ ____ | ____ ____ ____ fast
10. calm ____ ____ ____ | ____ ____ ____ upset
11. unimportant ____ ____ ____ | ____ ____ ____ important
12. smart ____ ____ ____ | ____ ____ ____ stupid
13. unfair ____ ____ ____ | ____ ____ ____ fair
14. not guilty ____ ____ ____ | ____ ____ ____ guilty

Describe: WORK

1. ugly ____ ____ ____ | ____ ____ ____ beautiful
2. hardworking ____ ____ ____ | ____ ____ ____ lazy
3. hazy ____ ____ ____ | ____ ____ ____ clear
4. smooth ____ ____ ____ | ____ ____ ____ rough
5. sad ____ ____ ____ | ____ ____ ____ happy
6. aggressive ____ ____ ____ | ____ ____ ____ withdrawn
7. worthless ____ ____ ____ | ____ ____ ____ valuable
8. good ____ ____ ____ | ____ ____ ____ bad
9. slow ____ ____ ____ | ____ ____ ____ fast
10. calm ____ ____ ____ | ____ ____ ____ upset
11. unimportant ____ ____ ____ | ____ ____ ____ important
12. smart ____ ____ ____ | ____ ____ ____ stupid
13. unfair ____ ____ ____ | ____ ____ ____ fair
14. not guilty ____ ____ ____ | ____ ____ ____ guilty

Describe: COMPETITION

1. ugly ____ ____ ____ | ____ ____ ____ beautiful
2. hardworking ____ ____ ____ | ____ ____ ____ lazy
3. hazy ____ ____ ____ | ____ ____ ____ clear
4. smooth ____ ____ ____ | ____ ____ ____ rough
5. sad ____ ____ ____ | ____ ____ ____ happy
6. aggressive ____ ____ ____ | ____ ____ ____ withdrawn
7. worthless ____ ____ ____ | ____ ____ ____ valuable
8. good ____ ____ ____ | ____ ____ ____ bad
9. slow ____ ____ ____ | ____ ____ ____ fast
10. calm ____ ____ ____ | ____ ____ ____ upset
11. unimportant ____ ____ ____ | ____ ____ ____ important
12. smart ____ ____ ____ | ____ ____ ____ stupid
13. unfair ____ ____ ____ | ____ ____ ____ fair
14. not guilty ____ ____ ____ | ____ ____ ____ guilty

Describe: IMAGINATION

1. ugly ____ ____ ____ | ____ ____ ____ beautiful
2. hardworking ____ ____ ____ | ____ ____ ____ lazy
3. hazy ____ ____ ____ | ____ ____ ____ clear
4. smooth ____ ____ ____ | ____ ____ ____ rough
5. sad ____ ____ ____ | ____ ____ ____ happy
6. aggressive ____ ____ ____ | ____ ____ ____ withdrawn
7. worthless ____ ____ ____ | ____ ____ ____ valuable
8. good ____ ____ ____ | ____ ____ ____ bad
9. slow ____ ____ ____ | ____ ____ ____ fast
10. calm ____ ____ ____ | ____ ____ ____ upset
11. unimportant ____ ____ ____ | ____ ____ ____ important
12. smart ____ ____ ____ | ____ ____ ____ stupid
13. unfair ____ ____ ____ | ____ ____ ____ fair
14. not guilty ____ ____ ____ | ____ ____ ____ guilty

Describe: FAITH

1. ugly ____ ____ ____ | ____ ____ ____ beautiful
2. hardworking ____ ____ ____ | ____ ____ ____ lazy
3. hazy ____ ____ ____ | ____ ____ ____ clear
4. smooth ____ ____ ____ | ____ ____ ____ rough
5. sad ____ ____ ____ | ____ ____ ____ happy
6. aggressive ____ ____ ____ | ____ ____ ____ withdrawn
7. worthless ____ ____ ____ | ____ ____ ____ valuable
8. good ____ ____ ____ | ____ ____ ____ bad
9. slow ____ ____ ____ | ____ ____ ____ fast
10. calm ____ ____ ____ | ____ ____ ____ upset
11. unimportant ____ ____ ____ | ____ ____ ____ important
12. smart ____ ____ ____ | ____ ____ ____ stupid
13. unfair ____ ____ ____ | ____ ____ ____ fair
14. not guilty ____ ____ ____ | ____ ____ ____ guilty

Describe: SUCCESS

1. ugly ____ ____ ____ | ____ ____ ____ beautiful
2. hardworking ____ ____ ____ | ____ ____ ____ lazy
3. hazy ____ ____ ____ | ____ ____ ____ clear
4. smooth ____ ____ ____ | ____ ____ ____ rough
5. sad ____ ____ ____ | ____ ____ ____ happy
6. aggressive ____ ____ ____ | ____ ____ ____ withdrawn
7. worthless ____ ____ ____ | ____ ____ ____ valuable
8. good ____ ____ ____ | ____ ____ ____ bad
9. slow ____ ____ ____ | ____ ____ ____ fast
10. calm ____ ____ ____ | ____ ____ ____ upset
11. unimportant ____ ____ ____ | ____ ____ ____ important
12. smart ____ ____ ____ | ____ ____ ____ stupid
13. unfair ____ ____ ____ | ____ ____ ____ fair
14. not guilty ____ ____ ____ | ____ ____ ____ guilty

Describe: **LOVE**

1. ugly ____ ____ ____ | ____ ____ ____ beautiful
2. hardworking ____ ____ ____ | ____ ____ ____ lazy
3. hazy ____ ____ ____ | ____ ____ ____ clear
4. smooth ____ ____ ____ | ____ ____ ____ rough
5. sad ____ ____ ____ | ____ ____ ____ happy
6. aggressive ____ ____ ____ | ____ ____ ____ withdrawn
7. worthless ____ ____ ____ | ____ ____ ____ valuable
8. good ____ ____ ____ | ____ ____ ____ bad
9. slow ____ ____ ____ | ____ ____ ____ fast
10. calm ____ ____ ____ | ____ ____ ____ upset
11. unimportant ____ ____ ____ | ____ ____ ____ important
12. smart ____ ____ ____ | ____ ____ ____ stupid
13. unfair ____ ____ ____ | ____ ____ ____ fair
14. not guilty ____ ____ ____ | ____ ____ ____ guilty

APPENDIX E

MULTIPLE REGRESSION ANALYSES

APPENDIX E

The multiple regression analyses were placed in the Appendix because it was felt that the obtained results reflected, in large measure, the analytic technique rather than fresh insights into the problems encountered here. These results also duplicated, in part, the findings of the factor analyses presented in the text.

One of the basic purposes in the present study was to generate some hypotheses as to what factors related to the various dimensions of classroom performance. In order to obtain some hunches along these lines, two multiple regression analyses were executed for groups A and B. The extended description of this procedure was given in the analysis section. Basically, it consisted of placing a large number of variables external to the classroom into a component analysis, generating principal component scores (factor scores) for each of the individuals in the study and then using these component scores as independent variables predicting the various dependent variables of classroom performance.

It was recognized by the investigators (and should be recognized by the reader) that the multiple correlation solution presented here represents only one of a large set of solutions that could be generated through this type of analysis. While the beta weights reported in the tables represent the best combination of components to generate the highest possible multiple correlation, it is also true that a slightly different set of variables could result in a different solution with a different pattern of weights. The results reported are, therefore, suggestive and exploratory rather than conclusive in nature.

Table G1 shows the multiple regression analysis findings obtained on Group A. The 12 factors found from the original principal components analysis are listed at the left of the Table together with the percentage

TABLE G1

Multiple Regression Analysis - Beta Coefficients by Sex

Group A

Component		Percentage* of Variance	Cognitive Memory		Divergent Thinking		Convergent Thinking		Evaluative Thinking	
			B	G	B	G	B	G	B	G
I	Family	14	25+	27		28				
II	Reading	12		54		29	-25		43	32
III	Divergence	12		45						72
IV	Love	8		-38	20	-36				-25
V	Verbal and Non-Verbal IQ	6		-30						-43
VI	Imagination	6			-47				-27	19
VII	Success	6	39			-43				
VIII	Competition	8		34				27		48
IX	School	7			-26				-37	
X	Solution-Seeking	5	-22		-22	30	-27			
XI	Serenity	7								30
XII	Student	8		-45			-24	-27	23	-48
		100								
	Multiple R		52	79	63	71	43	59	41	80

*Rounded to nearest per cent.

+Decimal points omitted.

of variance that is accounted for by each factor. Only three factors accounted for more than 10% of the variance; those dealing with attitudes towards family, reading skills, and divergent thinking. The rest of the factors accounted for from five to eight per cent of the total variance with little to choose between them. Multiple correlation coefficients obtained through the separate analyses of boys and girls are seen at the bottom of the table. It can be noted that the multiple R's obtained on the girls were consistently higher for each of the classroom dependent variables than those found for the boys. The multiple correlation coefficients for the boys were sufficiently low to suggest that there were important elements in the boys' performance that were not being predicted on the basis of existing factors in this analysis.

In the boys' performance, the beta weights seemed highly individual for each of the four classroom variables. On Cognitive Memory, factors that seemed to predict significantly were positive weights on factors of Success and attitude towards Family with a negative weight on Solutions as measured by the Consequences test. This combination can tentatively be suggested as a success-oriented pattern in which solution-seeking might be viewed as something of a luxury not directly related to the important goals of achievement. On classroom Divergent Thinking, the factor that produced a positive weight was Love, with negative weights on Imagination, School and, again, Solution-Seeking. This suggests, as has been previously indicated, that 'Divergent Thinking' as measured in the classroom is not a pure mental operation and includes many other elements. The negative attitude toward School and Imagination was somewhat suggestive of a non-conformist attitude but the positive attitude towards Love does not fit into this pattern.

On the classroom variable of Convergent Thinking, only two factors weighed significantly: a negative weight on Reading and a negative attitude on Solutions. Neither of these weightings would have been predicted on the basis of a priori judgment. Evaluative Thinking showed shows more predictable trends with a positive attitude towards Students, a positive weight on Reading skills, and with negative weights on Imagination and School. Since a good deal of Evaluative Thinking involves qualifying statements and quarreling with points already presented, it is possible that a certain degree of recalcitrance combined with good academic performance provides for this type of sublimated aggression. The combination of low multiple R's and a paucity of interpretable results suggests that limited confidence be placed on these results.

Unlike the boys, the girls showed a rather across-the-board pattern on expressive behavior with certain factors appearing repeatedly with significant weights predicting to the dependent variables. For the girls there were significant positive weights on Family, Reading, Divergence, and Competition together with negative weights on Love, IQ scores and Students on two or more of the dependent variables. As mentioned before, one of the characteristics of classroom-expressive girls seemed to be a general intellectual and social maturity, a maturity that could afford to appear less positive on factors such as Love and Student. The ratings on Semantic Differental scales of these students were highly positive when compared with possible negative or neutral statements. On the dependent variable of classroom Divergent Thinking, it is interesting to find a negative weighting on the factor of Success and on Student, suggesting a possible nonconforming trait with respect to commonly accepted values. On Evaluative Thinking, the divergence test factors appeared with a high weight, as does Competition.

One of the surprises of the analysis was the non-involvement of IQ scores in the prediction of expressive behavior on the part of the boys. It appeared that various attitudes and values were determining expressive behavior of this sample of gifted boys rather than cognitive variables. In contrast, there seemed to be a blend of cognition and values influencing the expressive behavior of the girls. Even when IQ was a relevant factor it carried a negative weight. Why girls with high IQ scores did not express themselves in the classroom is an interesting question in itself.

It is to be stressed that all of these statements relating to relationships of the various factors to classroom performance in this multiple regression analysis are highly tentative and are presented as suggestions for future investigations rathern than solid proof.

The multiple correlation coefficients obtained from the maximum combination of the factors for Group B can be seen at the bottom of Table G2. While these coefficients are respectable in size, it should be noted that the procedure used in the present study results in reducing the value of 'R.' In the process of combining the variables into principal component scores there is a certain amount of variance lost and error introduced. However, the decision was made to accept this loss in return for the greater intelligibility of interpretation brought about by the reduction of a large set of scores into a relatively few components or factors.

In Table G2 the results of Group B are indicated. One can see that the variance from the component analysis was spread quite widely among 14 components, with only components I and III accounting for more than 10 per cent of the total. The only weightings reported in Table G2 were

TABLE G2

Multiple Regression Analysis - Beta Coefficients by Sex

Group B

Component		Variance Percentage*	Cognitive Memory		Divergent Thinking		Convergent Thinking		Evaluative Thinking	
			B	G	B	G	B	G	B	G
I	Self-Confidence	16		25[+]		23		19		36
II	School	6				-24		-22		
III	Divergence	12	35	23	49	27	38	33	43	25
IV	Verbal and Non-verbal IQ	7								
V	Preadolescent Sex Orientation	5		-34		-29				
VI	Social Control	5							-24	-23
VII	Recreation	5	-39		-31		-40		-36	
VIII	Intellectual Self	6	19	-29	23			-22	26	
IX	Social Conventionality	7								-25
X	Family	7								
XI	Other People	5						-17		
XII	Education-Training	6					21		22	
XIII	Physical Self	5								
XIV	School Performance	5		34	22	33		21		
		100								
	Multiple R		67	63	64	63	69	59	63	61

*Rounded to nearest per cent.

[+] Decimal points omitted.

those that appeared to be significantly greater than error. In the multiple R calculated on Cognitive-Memory performance on the classroom only three of the 14 factors received significant weightings for the boys. Classroom performance on Cognitive-Memory seems to be related positively to the factor of Divergence and Intellecutal Self, together with a negative weight on the factor of Recreation.

As can be seen in Table G2, the girls had slightly different beta weights predicting to the same dependent variable of Cognitive-Memory performance in the classroom. In their case, positive weight were obtained on Divergence, Self-Confidence and attitudes toward their own School Performance. Negative weights were obtained on attitudes toward Intellectual Self and factor V, Preadolescent Sex Orientation. Factor V represented a combination of positive attitudes toward the same sex and negative attitudes toward the opposite sex. In this group, at this age, it was considered suggestive of a general immaturity of psychosexual development. In general, it can be said that the weighting obtained by the girls represent self-confidence and a willingness to express themselves, a general maturity of psychosexual orientation, a positive attitude to school performance but negative on intellectual self.

Due to the high intercorrelation previously reported between the four primary classroom dimensions, it would be expected that the weighting on the factors would be rather similar from one classroom performance variable to another and this does prove to be the case. Factor I, Self-Confidence, contributed a positive weight on the performance of the girls on each of the classroom variables, but, interestingly enough, did not appear as a positive or negative weighting for the boys on any of these variables. Factor III, Divergence, seemed to be positively weighted across all variables for both sexes and was suggestive of the fact that the divergent test performance was indicative of general expressive tendencies. Other factors that contributed weights across all classroom variables was factor VII, Recreation. The negative weighting for the Recreation factor was associated with all classroom performance variables of the boys, but with none of the girls.

Factor VIII represented another interesting sex difference--positive weightings for the boys were obtained on Intellectual Self, while negative weightings were obtained on intellectual self for the girls. Despite the general feeling of self-confidence on the part of the girls (Factor I) there appeared some specific negative self-feelings on the intellectual dimension. This contrast is seen on both Cognitive-Memory and Convergent Thinking.

Also, it can be noted that several factors do not weight on any of these classroom performance dimensions. Prominent among these are Factor IV, Nonverbal and Verbal IQ; Factor X, attitudes to Family; and Factor XIII, Physical Self. The interpretation of these findings, particularly that of the IQ scores, should be tempered by the fact that the IQ range here was limited, representing an all-gifted group. We should not expect to find similar results where the IQ range was much larger.

An interesting combination of weights also occurs on prediction of Evaluative Thinking in the girls. In this instance, negative weights were obtained on a factor of Social Conventionality and positive weighting on Divergent Thinking and Self-Confidence. This seemed to indicate that the girls who performed in a judgmental or opinion stating behavior had more confidence in themselves and less tendency to hold attitudes toward social conventionality.

In general, expressiveness in boys was positively related to factors of divergence, intellectual self and education-training and negatively related to the factor of recreation. Expressiveness in girls of Group B was positively related to divergence, self-confidence and a positive attitude towards own school performance. It was negatively related to the concept of intellectual self, pre-adolescent sex orientation and toward school itself. The performance of the girls deserves special interest. The results seem to support the general finding in the study that it is the girls with the most self-confidence, or the ones who are the most mature in a socio-emotional dimension who are the most expressive in the class. The contrary model, that it would be the 'odd-ball' or neurotic girl who would violate the general role expectation of girls in classrooms by contributing verbally, does not seem to be supported by the data in this present study.

APPENDIX F

STUDENT ACTIVITIES CHECK LIST - FAMILY STUDY

APPENDIX F

STUDENT ACTIVITIES CHECK LIST - FAMILY STUDY

Name____ Date____________________
(Last Name) (First Name)

On the following two pages you will find a list of different activities. For each activity you are to indicate with an "X" whether your mother or father would like you to do that activity more often or less often or whether your mother or father would like you to keep doing the activity as you are now doing it.

For example, if your mother would like you to watch television a lot less and brush your teeth a little more, you would mark as follows:

ACTIVITY	My mother wishes that I would do this activity:				
	Much less	A little less	As I do now	A little more	Much more
Watch television	X				
Brush my teeth				X	

Now - turn the page and work as rapidly as possible.

If your mother could change the following things about you, which of them do you think she would like to have you do more often, less--and which do you think she would like you to do as you do now? Please "X" one answer for each activity.

ACTIVITY	My mother wishes that I would do this activity:				
	Much less	A little less	As I do now	A little more	Much more
1. Think about school work					
2. Help around the house					
3. Show affection toward my father					
4. Go to church or Sunday school					
5. Stay out late at night					
6. Show affection toward my mother					
7. Take advice from older people					
8. Stand up for myself					
9. Be friendly to people					
10. Listen to my teachers					
11. Stick up for other people's rights					
12. Feel sorry for those who are in trouble					
13. Keep own room neat					
14. Worry about what goes on in the world					
15. Show my feelings toward my friends					
16. Try to be successful					
17. Take things seriously					
18. Trust people					
19. Go along with fads; for example: Rock and roll, hot rods, etc.					
20. Be happy to see company come					
21. Try to finish what I start					
22. Show care in picking out friends					

If your father could change the following things about you, which of them do you think he would like to have you do more often, less--and which do you think he would like you to do as you do now? Please "X" one answer for each activity.

ACTIVITY	'My father wishes that I would do this activity:				
	Much less	A little less	As I do now	A little more	Much more
1. Think about school work					
2. Help around the house					
3. Show affection toward my father					
4. Go to Church or Sunday school					
5. Stay out late at night					
6. Show affection toward my mother					
7. Take advice from older people					
8. Stand up for myself					
9. Be friendly to people					
10. Listen to my teachers					
11. Stick up for other people's rights					
12. Feel sorry for those who are in trouble					
13. Keep own room neat					
14. Worry about what goes on in the world					
15. Show my feelings toward my friends					
16. Try to be successful					
17. Take things seriously					
18. Trust people					
19. Go along with fads; for example: Rock and Roll, hot rods, etc.					
20. Be happy to see company come					
21. Try to finish what I start					
22. Show care in picking out friends					

APPENDIX G

FAMILY QUESTIONNAIRES

FATHER'S FORM - PART I

University of Illinois

Institute for Research on Exceptional Children

Children's Education Project - Family Study

APPENDIX G

Date ______________________________

1. Please list all persons (including yourself) living in this house (apartment) now.

	Name (Just give first names, including your own. Do not give last name)	Relation (Wife, daughter, son, Aunt, Wife's mother, etc.)	Age at last birthday
a.			
b.			
c.			
d.			
e.			
f.			

2. Please indicate your marital status: Married____; Divorced____;

Separated____; Widower____.

3. Date of marriage ____/____/____ Mo /Day/Year Residence at marriage ____________ (City and State)

4. Date of birth ____/____/____ Mo /Day/Year Where were you born? ____________ (City and State)

5. Please give the name of the last school that you attended ____________

____

6. Please indicate the last grade that you completed in that school (Encircle)

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18+

7. If you hold a degree from a college or university please indicate that degree and the field in which it was taken, e.g., B.S. in Education, M.A. in Psychology, etc.

____

____

8. Please indicate the year in which you completed your formal education

____

9. Indicate any other schooling that you might have had (Trade school, night school, adult education, training or education received in Armed Forces, etc.)

____

____

10. What is your religious preference or affiliation?________________

____

INSTRUCTIONS FOR QUESTIONS 11 AND 12: In giving your occupation and the business or industry in which you work please be as specific as possible. Specific information is required in order to make it possible for us to accurately classify your occupation. We would appreciate it if you follow the rules listed below:

a. In giving your occupation indicate what it is that you actually do. For example, write "turret lathe operator" rather than simple "factory worker;" "Vice president in charge of sales" rather than simply "executive."

b. If you have an official title, please note that title. For example, write "Associate Professor of Education" rather than simply "college teacher."

c. If you are in business for yourself (self-employed) or if you work for someone else but own your own tools and equipment (trucks, machinery, electronic equipment) please make a note of it.

d. If you have more than one occupation list all of them and underline the one that you consider to be your major occupation.

e. Please give the business or industry in which you work rather than simply listing the name of the firm or organization. For example, indicate retail store, bank or credit agency, construction, etc. If in sales work, indicate whether wholesale or retail; selling to individuals, firms or to the government.

11. What is your usual occupation?__________________________

____

____

12. In what business or industry do your work?__________________

____

13. About how long have you been engaged in your present major occupation? (Do not count promotions, changes in location of work, etc. as changes in occupation).

____

14. Please list all of the occupations or lines of work that you have engaged in since you completed your formal education. It would be helpful if you listed the occupations in chronological order. Do not count promotions or changes in location of work as change in occupation. If you have not changed your occupation since completing your formal education write "none" in the first blank.

a.____________________ d.____________________

b.____________________ e.____________________

c.____________________ f.____________________

15. Read over the statements to follow and check the one statement that best describes your own feelings about why you are engaged in your present line of work: Gives me something to do to occupy my time___; gives me self-respect____; permits me to associate with people I like____; provides a source of income for me and my family____; permits me to use my abilities to create new things and ideas___; permits me to be of service to others____; Other reason (specify):__________

____

____

____

16. Are you a member of the University High School Parent-Faculty Organization? Yes, I am a member____; No, I am not a member____.

17. About how many times have you attended Parent-Faculty Organization meetings during the present school year (September, 1961 to present)?

__________times.

18. If you have ever held an office within the University High School Parent-Faculty Organization and/or if you have served on Parent-Faculty Organization committees please indicate the offices you have held or now hold and the committees on which you have served or are now serving. If you have not held an office or served on a committee please write "none" in the appropriate space below.

Office held	Committee membership
____________________	____________________
____________________	____________________
____________________	____________________

19. Please give the last names of those teachers at University High School that you have met and spoken to in person. If you have not met and spoken to any of the teachers please write "none" in the first blank.

______________________________ ______________________________

______________________________ ______________________________

______________________________ ______________________________

20. Have you ever requested a conference with any of the University High School teachers, counselors, or administrative staff in order to discuss your child's progress in school? Yes____; No____.

21. Regardless of how generally satisfied we are with something we can usually suggest some possible improvements. What are some of the possible improvements that you would like to suggest with respect to the education that your children are receiving?

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SUCCESS IN MARRIAGE AND FAMILY

Below are listed standards by which family success has been measured. Look through the list and mark 1 after the item you consider most important in judging the success of families (in the column headed Rank). Look through the list again and mark 2 after the item you consider next important. Keep doing this until you have a number after each item.

There is no order of items which is correct; the order you choose is correct for you. Remember, there can be only one item marked 1, one item marked 2, one item marked 3, ... one item marked 10.

RANK

A place in the community. The ability of a family to give its members a respected place in the community and to make them good citizens (not criminals or undesirable people). . . . . ________

Healthy and happy children. ________

Companionship. The family members feeling comfortable with each other and being able to get along together . . . . ________

Personality development. Continued increase in family member's ability to understand and get along with people and to accept responsibility . . . . ________

Satisfaction in affection shown. Satisfaction of family members with amount of affection shown and of the husband and wife in their sex life. . . . . ________

Economic security. Being sure that the family will be able to keep up or improve its standard of living . . . . ________

Emotional security. Feeling that the members of the family really need each other emotionally and trust each other fully. . . . . ________

Moral and religious unity. Trying to live a family life according to religious and moral principles and teaching . . . . ________

Everyday interest. Interesting day-to-day activities having to do with house and family which keep family life from being boring . . . . ________

A home. Having a place where the family members feel they belong, where they feel at ease, and where other people do not interfere in their lives. ________

Please compare personality traits of your wife, ________________, and yourself below. The degrees to which people may have these traits are listed across the top -- from "very much" to "not at all." Please mark the degree to which you feel that your wife, the child indicated above and you yourself have the trait.

Mark Y for yourself, W for your wife, and 1 for the child indicated.

For example, if you and your wife had a trait very much and your child did not have the trait at all, you would mark "Y" and "W" in the "very much" box and "1" in the "hasn't the trait at all" box. (See Example below).

Circle any rating about which you are not certain.

TRAITS	DEGREE TO WHICH PERSON HAS TRAIT				
	Has trait very much	Has trait considerably	Has trait somewhat	Has trait a little	Hasn't the trait at all
EXAMPLE: Likes to go fishing	Y W				1
Imaginative					
Stubborn					
Gets angry easily					
Likes to watch TV					
Feelings easily hurt					
Sense of humor					
Nervous or irritable					
Moody					
Independent					
Jealous					
Dominating or bossy					
Easily excited					
Flexible					
Easily depressed					
Creative					
Self-centered or selfish					

MOTHER'S FORM - PART I

University of Illinois

Institute for Research on Exceptional Children

Children's Education Project - Family Study

G-8

Date____________________________

1. Please list all persons (including yourself) living in this house (apartment) now.

	Name (Just give first names, including your own. Do not give last name)	Relation (Husband, daughter, son aunt, husband's mother, etc.)	Age at last birthday
a.			
b.			
c.			
d.			
e.			
f.			

2. Please indicate your marital status: Married____; Divorced____; Separated____; Widow____.

3. Date of marriage __/__/__ Mo /Day/Year Residence at marriage____________________ (City and State)

4. Date of birth __/__/__ Mo /Day/Year Where were you born?____________________ (City and State)

5. Please give the name of the last school that you attended____________________

____

6. Please indicate the last grade that you completed in that school (encircle)

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18+

7. If you hold a degree from a college or university please indicate that degree and the field in which it was taken, e.g., B. S. in Education, M. A. in Psychology.

____

8. Please indicate the year in which you completed your formal education__________

9. Please indicate any other schooling that you might have had (secretarial training, nurse's training, night school, adult education, etc.)

____

____

10. What is your religious preference or affiliation?____________________

____

INSTRUCTIONS FOR QUESTIONS 11 THROUGH 15:

a. If, at the present time, you are strictly a homemaker, simply write in the work "homemaker" for Question 11 and skip to Question 13. However, even if you do not hold a job at the present time, please be sure to answer Question 13 and either Question 14 or Question 15, whichever is appropriate.

b. If you are now employed at a job for which you receive wages, salary, etc., then please observe the following rules in answering Question 11:

(1) Please be specific about what it is that you actually do. For example, write "legal secretary" rather than simply "secretary" or "office work." Write "teacher of college rhetoric" or "primary grades teacher" rather than simply "teacher."

(2) If your work is connected with your husband's occupation, please write "with husband" following your description of your job. If you do your work in your home please write "at home" after your job description.

11. What is your usual occupation?____

____

____

12. What is the average number of hours per week that you spend at your job?

About _______hours.

13. If you have worked since your marriage, please indicate below (check) the years during which you were employed for at least two months of that year, beginning with the year of your marriage. Indicate whether you were employed full-time (40 hours per week) or part-time (less than 40 hours per week) by checking the appropriate category opposite the year. If employed for less than two months of a year check the "not working" category.

	Full time	Part time	Not working		Full time	Part time	Not working		Full time	Part time	Not working
1938				1946				1954			
1939				1947				1955			
1940				1948				1956			
1941				1949				1957			
1942				1950				1958			
1943				1951				1959			
1944				1952				1960			
1945				1953				1961			
								1962			

14. If you have worked at any time since your marriage, have you done so because (check): You think a wife should retain economic independence____; a wife is a better companion when working____; you enjoy your work so much____; you need something to keep you busy____; your income is not sufficient for all you need ____; you are trying to accumulate some savings____; other reason (specify)___

____

____

15. If you have not ever worked since your marriage is it because (check): You think a woman's place is in the home____; friends or relatives disapprove____; husband disapproves____; you are (were) tired of working____; haven't wanted to____; haven't been able to get work____; other reason (specify)____________

____

____

16. Are you a member of the University High School Parent-Faculty Organization? Yes, I am a member____; No, I am not a member____.

17. About how many times have you attended Parent-Faculty Organization meetings during the present school year (September, 1961 to present)? ______times.

18. If you have ever held an office within the University High School Parent-Faculty Organization and/or if you have served on Parent-Faculty Organization Committees please indicate the offices you have held or now hold and the committees on which you have served or are now serving. If you have not held an office or served on a committee please write "none" in the appropriate space below.

Office held	Committee membership

19. Please give the last names of those teachers at University High School that you have met and spoken to in person. If you have not met and spoken to any of the teachers please wirte "none" in the first blank.

______________________________ ______________________________

______________________________ ______________________________

______________________________ ______________________________

20. Have you ever requested a conference with any of the University High School teachers, counselors, or administrative staff in order to discuss your child's progress in school? Yes____; No____.

21. Regardless of how generally satisfied we are with something we can usually suggest some possible improvements. What are some of the possible improvements that you would like to suggest with respect to the education that your children are receiving?

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SUCCESS IN MARRIAGE AND FAMILY

Below are listed standards by which family success has been measured. Look through the list and mark 1 after the item you consider most important in judging the success of families (in the column headed Rank). Look through the list again and mark 2 after the item you consider next important. Keep doing this until you have a number after each item.

There is no order of items which is correct; the order you choose is correct for you. Remember, there can be only one item marked 1, one item marked 2, one item marked 3, ... one item marked 10.

RANK

A place in the community. The ability of a family to give its members a respected place in the community and to make them good citizens (not criminals or undesirable people). . . . . __________

Healthy and happy children. __________

Companionship. The family members feeling comfortable with each other and being able to get along together.. . . . . __________

Personality development. Continued increase in family member's ability to understand and get along with people and to accept responsibility. . . . . __________

Satisfaction in affection shown. Satisfaction of family members with amount of affection shown and of the husband and wife in their sex life. . . . . __________

Economic security. Being sure that the family will be able to keep up or improve its standard of living . . . . __________

Emotional security. Feeling that the members of the family really need each other emotionally and trust each other fully. . . . . __________

Moral and religious unity. Trying to live a family life according to religious and moral principles and teaching. . . . . __________

Everyday interest. Interesting day-to-day activities having to do with house and family which keep family life from being boring. . . . . __________

A home. Having a place where the family members feel they belong, where they feel at ease, and where other people do not interfere in their lives. __________

Please compare personality traits of your husband, ______________________, and yourself below. The degrees to which people may have these traits are listed across the top -- from "very much" to "not at all." Please mark the degree to which you feel that your husband, the child indicated above and you yourself have the trait.

Mark Y for yourself, H for your husband, and 1 for the child indicated.

For example, if you and your husband had a trait very much and your child did not have the trait at all, you would mark "Y" and "H" in the "very much" box and "1" in the "hasn't the trait at all" box. (See example below).

Circle any rating about which you are not certain.

TRAITS	DEGREE TO WHICH PERSON HAS TRAIT				
	Has trait very much	Has trait considerably	Has trait somewhat	Has trait a little	Hasn't the trait at all
EXAMPLE: Likes to go fishing	Y H				1
Imaginative					
Stubborn					
Gets angry easily					
Likes to watch TV					
Feelings easily hurt					
Sense of humor					
Nervous or irritable					
Moody					
Independent					
Jealous					
Dominating or bossy					
Easily excited					
Flexible					
Easily depressed					
Creative					
Self-centered or selfish					

FATHER'S FORM - PART II*

University of Illinois

Institute for Research on Exceptional Children

Children's Education Project - Family Study

*Mother's and Father's Forms Identical in Part II

If you could change the following activities of ____________________ merely by checking them below, which of the following activities would you like to have him do more or less and which would you like for him do as he does now? Please check an answer for each activity.

ACTIVITY	I wish my son would do this activity:				
	Much less	A little less	As he does now	A little more	Much more
1. Think about school work.					
2. Help around the house.					
3. Show affection toward his father.					
4. Go to church or sunday school.					
5. Stay out late at night.					
6. Show affection toward his mother.					
7. Take advice from older people.					
8. Stand up for himself.					
9. Be friendly to people.					
10. Listen to his teachers.					
11. Stick up for other people's rights.					
12. Feel sorry for those who are in trouble.					
13. Keep his own room neat.					
14. Worry about what goes on in the world.					
15. Show his feelings toward his friends.					
16. Try to be successful.					
17. Take things seriously.					
18. Trust people.					
19. Go along with fads; for example: Rock and Roll, hot rods, etc.					
20. Be happy to see company come.					
21. Try to finish what he starts.					
22. Show care in picking out					

BEHAVIOR CHOICES

Listed below are some ways of thinking and behaving learned by children. Look through the list and mark 1 (in the column Rank) after the item that you would most prefer that your child learn or do. Then look through the list again and mark 2 after that item that you would next prefer that he learn or do. Continue doing this until you have a number after each item.

There is no order of items which is correct. The order that you choose is correct for you. Remember, there can be only one item marked 1, one item marked 2, one item marked 3, . . . one item marked 10.

I WOULD PREFER THAT ______________________________ WOULD: RANK

Strive to attain a solid fund of exact knowledge....... __________

Learn to do the things that he enjoys doing........... __________

Learn to be careful about the impression that he makes on others...................................... __________

Learn to trust his own judgment....................... __________

Choose friends who are neat, well-mannered and who come from good backgrounds............................. __________

Learn to do the things that will help him to get ahead later in life.. __________

Learn to use his imagination in developing new approaches to problems................................. __________

Choose friends who have a sense of humor and a mature outlook on life...................................... __________

Learn to consider the opinions of others.............. __________

Learn not to be too concerned about the impression that he makes on others.................................. __________

Developmental Timetable

In this portion of the questionnaire you are asked to record either the approximate age at which you began to expect that ______________________ could begin to manage certain situations or the approximate age at which you will begin to expect him to manage certain situations.

Thus, when recording the ages for your child, there will probably be some situations for which you will have to project into the future and give the approximate age at which, in your opinion, your child can begin to manage certain situations.

Obviously, there are no "right" or "wrong" answers to this type of question. Your estimates and opinions are what we want. We only ask that you do not consult with your spouse or with any other person inasmuch as it is your best individual estimate or opinion that we want.

Below is an example of what is to follow:	AGE
Begin to train him to tie his own shoes at about age............	6

Please be sure to record an age for your child after each item.

Record all ages to the nearest whole year. For example, write either "5", or "6" rather than "5½."

Draw a circle around any answer about which you are not certain.

AGE

1. Begin to train him to accept a postponement of what he wants without making a fuss at about age.............................. __________

2. Begin allowing him to decide for himself when he should go to bed at about age.. __________

3. Begin to train him not to get "make believe" and "pretend" mixed up with real life at about age............................... __________

4. Begin allowing him to play away from home for long periods of time during the day without first telling his parents where he will be at about age.. __________

5. Begin to teach him not to "blow up" when he is "boiling" inside at about age.. __________

6. Begin allowing him to ride a two-wheel bicycle in streets where there is only light traffic at about age...................... __________

7. Begin to encourage him to start thinking about the line of work he would like to go into in adult life at about age............ __________

8. Begin allowing him to spend money he earns in any way he wants (even if it seems wasteful to the parents) at about age......... __________

9. Begin to teach him that he will have to work hard if he is to reach his goals in life at about age.......................... __________

10. Begin allowing him to go out on a "date" if a crowd of friends will be along at about age................................... __________

11. Begin to train him to keep his own room tidy at about age....... __________

12. Begin allowing him to have friends of his own choosing (even if the parents do not approve of his choice) at about age.......... __________

13. Begin to train him to hang up his clothes right after they are taken off at about age.. __________

14. Begin allowing him freedom of choice in deciding what movie to go to among those showing in neighborhood theaters at about age.... __________

15. Begin to make him aware of the cost of objects that he damages at about age.. __________

16. Begin allowing him to make "dates" without first asking for parental approval at about age.................................. __________

17. Begin to teach him to be concerned about his personal appearance at about age.. __________

18. Begin to allow him to buy his own shoes and clothing without parental advice at about age.................................... __________

AGE

19. Begin allowing him to go on overnight camping trips with a group of friends of the same sex, with no adult supervision, at about age.. __________

20. Begin to encourage him to finish whatever he starts at about age __________

21. Begin allowing him to choose for himself the clothing he will wear to school during the day at about age..................... __________

22. Feel that he is mature enough to "go steady" at about age....... __________

23. Begin encouraging him to use a dictionary rather than asking adults for the meaning of words at about age.................. __________

24. Discourage him from seriously considering marriage until he is about age.. __________

25. Begin to request his permission to read mail addressed to him at about age.. __________

26. Begin to encourage him to use the public library on his own at about age.. __________

27. Begin allowing him to read "adult" books and magazines (fiction) at about age.. __________

28. Begin training him to help with the dishes after the evening meal at about age.. __________

29. Begin to allow him to take an active part at adult parties and gatherings in the home at about age.......................... __________

30. Begin to train him to become aware of the consequences of the things that he does at about age............................ __________

31. Begin allowing him to decide for himself whether or not he will accompany his parents on visits to the homes of relatives and friends at about age...................................... __________

32. Begin encouraging him to take a part-time job at about age...... __________

33. Expect him to become financially independent at about age....... __________

34. Expect him to complete his formal education at about age........ __________

35. Begin allowing him a "vote" in decisions which affect all family members at about age... __________

36. Expect him to start to become concerned about the impression that he makes on other people at about age........................ __________

G-20

LIFE GOALS

Listed below are some choices which __________________________ may eventually have to make in his lifetime. Look through the list and mark 1 after the item that you hope he would consider the most important goal in life (in the column headed Rank). Then look through the list again and mark 2 after the item that you hope he would consider the next most important goal in life. Continue to do this until you have a number after each item.

There is no order of items which is correct. The order that you choose is the correct order for you. Remember, there can be only one item marked 1, one item marked 2, one item marked 3, . . . one item marked 10.

	RANK
Be a highly respected community leader.................	
Be practical and serious minded........................	
Try to help friends to enjoy life......................	
Focus his life around marriage and the family..........	
Attain a high degree of success in a business or profession...	
Have many close friends and be well liked..............	
Be devoted to a worthwhile cause.......................	
Learn to accept hardships and to live with them........	
Make a literary, philosophical, or scientific contribution to mankind.................................	
Learn not to take life too seriously...................	

1. When I begin to allow my son to make his own choices and decisions about things I usually begin to allow him to do so because (check one answer):

   I feel that he has received enough training so that he will usually do what I feel is best for him...................... ________

   I feel that he is now mature enough to decide what is best for him even though I may not agree with all of his decisions.... ________

2. When my son does something of which I do not approve, I usually (check one answer):

   Tell him immediately that I disapprove and explain why....... ________

   Wait for awhile to see if he will correct his mistake by himself before saying anything to him......................... ________

3. I believe that parents should (check one answer):

   Adapt child-rearing practices to the specific child.......... ________

   Follow essentially the same child-rearing practices for all of their children... ________

4. Briefly, what do you feel is the most important responsibility that parents have toward their children?

   ____

   ____

   ____

5. Briefly, what do you feel is the most important responsibility that children have toward their parents?

   ____

   ____

   ____

6. Since the time that our first child was born I feel that my opinions and ideas about raising children have (check one): Changed a great deal____; changed considerably____; changed somewhat____; changed a little____; not changed at all____.